

CIGI Paper No. 343 – December 2025

AI and Trade: The WTO's Thoughtful but Incomplete Assessment

Susan Ariel Aaronson



CIGI Paper No. 343 – December 2025

AI and Trade: The WTO's Thoughtful but Incomplete Assessment

Susan Ariel Aaronson

About CIGI

The Centre for International Governance Innovation (CIGI) is an independent, non-partisan think tank whose peer-reviewed research and trusted analysis influence policy makers to innovate. Our global network of multidisciplinary researchers and strategic partnerships provide policy solutions for the digital era with one goal: to improve people's lives everywhere. Headquartered in Waterloo, Canada, CIGI has received support from the Government of Canada, the Government of Ontario and founder Jim Balsillie.

À propos du CIGI

Le Centre pour l'innovation dans la gouvernance internationale (CIGI) est un groupe de réflexion indépendant et non partisan dont les recherches évaluées par des pairs et les analyses fiables incitent les décideurs à innover. Grâce à son réseau mondial de chercheurs pluridisciplinaires et de partenariats stratégiques, le CIGI offre des solutions politiques adaptées à l'ère numérique dans le seul but d'améliorer la vie des gens du monde entier. Le CIGI, dont le siège se trouve à Waterloo, au Canada, bénéficie du soutien du gouvernement du Canada, du gouvernement de l'Ontario et de son fondateur, Jim Balsillie.

Credits

Senior Fellow **S. Yash Kalash**
Director, Program Management **Dianna English**
Program Manager **Grace Wright**
Publications Editor **Lynn Schellenberg**
Publications Editor **Susan Bubak**
Manager, Publications **Jennifer Goyder**
Graphic Designer **Abhilasha Dewan**

Copyright © 2025 by the Centre for International Governance Innovation

The opinions expressed in this publication are those of the author and do not necessarily reflect the views of the Centre for International Governance Innovation or its Board of Directors.

For publications enquiries, please contact publications@cigionline.org.



The text of this work is licensed under CC BY 4.0. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

For reuse or distribution, please include this copyright notice. This work may contain content (including but not limited to graphics, charts and photographs) used or reproduced under licence or with permission from third parties. Permission to reproduce this content must be obtained from third parties directly.

Centre for International Governance Innovation and CIGI are registered trademarks.

67 Erb Street West
Waterloo, ON, Canada N2L 6C2
www.cigionline.org

Table of Contents

vi	About the Author
vi	Acronyms and Abbreviations
1	Executive Summary
1	Introduction
2	Background: The Trade-AI Relationship
5	Key Points Put Forward by the WTO Report
6	Areas of Incomplete Analysis
11	Final Thoughts
13	Works Cited

About the Author

Susan Ariel Aaronson is a CIGI senior fellow, research professor of international affairs at George Washington University (GWU) and co-principal investigator with the NSF-NIST Institute for Trustworthy AI in Law & Society, where she leads research on data and AI governance. She is also a GWU Public Interest Technology Scholar and a Basillie Tech Scholar. Her research interests relate to the relationship between economic change, human rights and good governance.

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 AI overcapacity. She regularly writes op-eds for *Barron's*, *Fortune* and other publications, and has been a commentator 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.

In her spare time, Susan enjoys triathlons and ballet.

Acronyms and Abbreviations

AI	artificial intelligence
DEPA	Digital Economy Partnership Agreement
DTAs	digital trade agreements
GATT	General Agreement on Tariffs and Trade
IP	intellectual property
LLMs	large language models
OECD	Organisation for Economic Co-operation and Development
R&D	research and development
TBT Agreement	Agreement on Technical Barriers to Trade
UAE	United Arab Emirates
USMCA	United States-Mexico-Canada Agreement
WTO	World Trade Organization

Executive Summary

In 2024, at the behest of its members, the Secretariat of the World Trade Organization (WTO) decided to study how artificial intelligence (AI) was affecting trade. The authors of the report that resulted, *Trading with intelligence: How AI shapes and is shaped by international trade*, set out to answer two key questions: How can the WTO help ensure that the benefits of AI are broadly shared? And, how can the challenges that AI presents be addressed in a globally coordinated manner? Although the report covers these questions, the analysis centred on the report's subtitle: *How AI shapes and is shaped by international trade*.

This paper is both a review of the WTO's report and a riff on how AI is prodding a rethink not only of trade rules but also of how and what nations trade. The author examines the trade and technology relationship and then discusses how AI poses challenges to how trade is conducted and the existing system of rules. In its review, this paper shows that the WTO's assessment, while comprehensive, is incomplete: it does not discuss key issues such as AI protectionism or suggest steps that the 166 members of the WTO might take to address how AI shapes trade and how trade shapes AI.

The author recognizes that the WTO must act on the direction of its members. However, the author recommends that the WTO partner with civil society groups that have expertise in competition policy and data governance to advise it; do research on global issues such as the trade implications of web scraping; and utilize trade policy reviews to facilitate greater understanding of global data markets.

Introduction

Chatbots such as ChatGPT, DeepSeek and Claude are “poster children” for the benefits of trade.¹ These chatbots use conversational AI techniques to understand user questions. Individuals, governments and private firms on every continent use these bots to recognize, summarize, translate, predict and analyze data.² Although such AI bots are generally produced in the United States, Europe and China, they are truly global products because they are built on expertise, data, computing power and capital sourced from around the world.³ Moreover, they have potential to serve the global public interest because of their ability to address complex research problems that transcend borders and present new methodologies (Aaronson 2023; Anthis et al. 2025).

Member states of the WTO increasingly use AI to make decisions, analyze data and expand trade. The WTO is charged with administering trade agreements within its purview, acting as a forum for trade negotiations, settling trade disputes, reviewing national trade policies, building the trade capacity of developing economies and cooperating with other international organizations.⁴ Hence, the WTO Secretariat (2024) sought to create greater understanding of how AI shapes and is shaped by international trade through their study *Trading with intelligence: How AI shapes and is shaped by international trade*. This paper assesses that report in light of both the WTO's important functions and the scholarly literature.

Trading with intelligence was written by staff in the Secretariat with significant expertise on both technology and trade. The WTO is a member-driven institution. The Secretariat has limited autonomy, and thus must put forward an analysis that is

1 Grand View Research (www.grandviewresearch.com/industry-analysis/chatbot-market) estimates the global chatbot markets as US\$7.76 billion in 2024 and expects it will grow at 23.3 percent annually. At time of writing, official statistics were not available. See also Rebelo (2025).

2 See www.ibm.com/think/topics/chatbots.

3 See www.tableau.com/data-insights/ai/history; Mucci (n.d.); Amodei (2024).

4 See www.wto.org/english/thewto_e/whatis_e/inbrief_e/inbr_e.htm.

broadly acceptable to 166 member states.⁵ The inside cover of the report includes a disclaimer that the report “does not necessarily reflect the positions or opinions of WTO members” and is presented “without prejudice to their rights and obligations under the WTO agreements” (ibid., ii).

The authors of *Trading with intelligence* can illuminate problems and highlight processes at the WTO that may contribute to their resolution. But they cannot suggest how member states might use trade rules to address some of the trade challenges posed by AI, such as a rising reluctance to share various types of data across borders. Despite these limitations, the WTO Secretariat has produced a thoughtful assessment of the trade and AI relationship. However, although the report clearly asserts that AI could help all economies trade more, it does not provide a full road map outlining how to get there. Further, the report does not address rising AI and data protectionism, nor the growing AI sovereignty movement.

The Secretariat says it sought to answer two questions: “How can the WTO help ensure that the benefits of AI are broadly shared? How can the challenges that AI presents be addressed in a globally coordinated manner?” (ibid., 5). Although the Secretariat did attempt to answer these questions, most of the report considers instead the question posed by its subtitle: how AI shapes and is shaped by international trade.

The report’s authors rely on a broad definition of AI, citing both the Organisation for Economic Co-operation and Development (OECD) and the International Organization for Standardization (ibid., 14). They note that AI is a general-purpose technology with wide application, including uses to enhance human welfare (ibid., 15). They do not discuss its national security implications.

The authors do not describe their methodological approach to the two questions driving their inquiry, although they do discuss how they simulated the global trade and GDP impact of AI (using the WTO Global Trade Model) (ibid., 29–31). Instead, their report discusses why AI is becoming a trade issue:

the policy questions raised by AI and trade, and the role the WTO might play as a forum in answering these questions (ibid., 6–10). The report contains a short section on “minimizing negative international spillovers” (ibid., 77–78), as well as a two-page overview of “scholars’ views on the possible implications of AI for international trade rules” (ibid., 82–84). But the WTO did not thoroughly address the multi-faceted nature of AI as a dual-use technology, a general-purpose technology and a public good, and how governments might struggle to facilitate these multiple uses. Nor do the authors address the threat of data sovereignty and digital protectionism. Finally, although the authors acknowledge that WTO rules may need clarification or revision, they barely discuss how trade policy makers might adapt these rules to address the age of AI. In response, some possible adaptations are suggested in the pages that follow.

The WTO is not the first research organization to examine how trade rules may affect the AI supply chain, AI competitiveness, AI governance and the diffusion of AI around the world. Several researchers have looked at questions such as how AI is affected by trade rules, how AI is changing trade, and what gaps exist in AI governance and its trade spillovers (Chander and Schwartz 2023; Ciuriak 2024; Goldfarb and Treffer 2018; Jones 2023; Aaronson 2018b, 2024b; Ahmed and Naas 2024; Peng, Lin and Streinz 2021).

This review proceeds as follows: it begins with an overview of what has gone wrong in the relationship between trade and AI and why, then discusses what is in the WTO report, before concluding with suggestions for actions that the WTO Secretariat might take. The author’s review focuses on AI regulation and regulatory interoperability and then turns to data governance within and among nations’ data and regulatory governance, as her areas of expertise. The section includes some recommendations for WTO members and officials’ consideration.

Before proceeding, the author must disclose her own involvement with this topic at the WTO. First, in 2023, the author developed a series of seminars on emerging technology, including AI, for WTO staff. Second, the author provided feedback on a draft of the report, as did many other scholars named in the Acknowledgements (WTO Secretariat 2024, 2). Some of the author’s comments as an outside reviewer were reflected in the published report, and others were not. Because the WTO is a member-driven organization,

⁵ See www.wto.org/english/thewto_e/secret_e/intro_e.htm, which notes, “The Secretariat’s main duties are to supply technical and professional support to the WTO’s councils and committees, to provide technical assistance for developing countries, to monitor development in world trade, to conduct economic research, to disseminate information on WTO activities to a variety of audiences and to organize ministerial conferences. It also provides legal assistance in the WTO’s dispute settlement process and advises governments wishing to join the WTO.”

its staff must follow protocol: Secretariat staff cannot advise members on their trade strategies or negotiating positions or address certain issues because of their political or strategic nature.

Background: The Trade-AI Relationship

Technology and trade generally have a mutually beneficial relationship. Trade is a means of enhancing human welfare, as is innovation. New technologies often inspire more trade as individuals try to adopt new technologies — from cars to XR (extended reality) headsets. Moreover, technological advances can give rise to innovative goods, such as electric vehicles; novel processes, such as 3D printing; contemporary job categories, such as AI assistants; and up-to-date modes of transportation, such as containerization. Over time, these advances will stimulate economic growth and productivity (Freund 2023). Scholars have found that trade agreements often facilitate the internationalization of technology (Martínez-Zarzoso and Arregui Coka 2025). In addition, the knowledge behind the latest technologies can be transferred at either no or a relatively low cost and applied by multiple users. In this way, trade in technology allows multiple countries to combine research and development (R&D) efforts and to take advantage of a particular innovation (Spulber 2008).

But trade in AI is not always yielding more trade and the sharing of new ideas. In some instances, policy makers are deliberately distorting trade in AI and the AI supply chain, such as with semiconductors (Aaronson 2024a). For example, Japan, the Netherlands and the United States have adopted export controls on high-speed computer chips in the hopes of slowing China's AI advancement (Reuters 2024; Shivakumar, Wessner and Howell 2024). In response, China has banned the export of critical materials needed to make such chips (Kurtenbach 2024). These governments argue that such bans are necessary to protect national security, but officials in targeted government and other affected nations may perceive these actions as a form of economic coercion that could lead to less trade. Meanwhile, some 20 countries have banned one specific AI product, the social

network TikTok. Some of these TikTok bans are temporary, some are only on official devices, and others are broader (Chan 2024). In the early months of 2025, a Chinese company, DeepSeek, produced an AI chatbot (also called DeepSeek) that did extremely well on various learning and reasoning tests. The model was supposedly built using less energy and less-sophisticated chips (Yang 2025; Tobin, Mozur and Stevenson 2025). Soon thereafter, Australia, Taiwan and the United States forbade government employees from using the chatbot on government devices, while other countries such as Italy are investigating its privacy practices (Chuang 2025; Wiggers 2025; Andrews 2025). If a country, for example, Taiwan, bans DeepSeek, its citizens cannot learn from the technology or better understand how it was engineered. Here again, advances in AI are both stimulating trade and limiting it.

Why is trade in AI leading some nations to take extreme steps such as bans and export controls? There may be several reasons, but the WTO discusses only some of them.

First, policy makers recognize the many roles of AI in the economy and polity as a public good and general-purpose, dual-use technology. Technologies such as AI have a *public good* function: AI could enhance human welfare, increase human capability, improve government services and help to mitigate “wicked problems” — those that transcend generations and borders.⁶ Moreover, many economists now view AI as a “general-purpose” technology that will alter jobs, enhance economic growth and increase efficiency (Brynjolfsson, Rock and Syverson 2021; Crafts 2021). For example, several studies have shown that developing countries could use AI to trade more, to diversify their trade and to make their exports more competitive (Mishra et al. 2023). Policy makers also recognize that AI is increasingly essential in conflicts to protect civilians, predict enemy behaviour and identify targets (Humble 2024; International Committee of the Red Cross 2023). Thus, many officials view AI as a “dual-use technology” — essential to both national security and economic growth. To ensure that AI achieves one or more of these roles, policy makers

⁶ See <https://jainfamilyinstitute.org/artificial-intelligence-for-the-public-good/>; Ibison (2023); Working Group on Artificial Intelligence and Its Implications for the Information and Communication Space (2024).

understand that they must nurture and sustain AI. The WTO's report does not discuss this issue.

Second, AI competitiveness has become not only a competition between the United States and China but also among other wealthy nations. Firms and other research organizations based in France, the United Arab Emirates (UAE) and the United Kingdom have developed foundation models that perform well on AI leaderboards, although they often partner with US firms to create these models.⁷ Here, again, the WTO does not discuss this point.

Third, although they have tried, policy makers have so far been unable to find shared governance strategies for AI governance (Acemoglu 2025). Given these different approaches, some consumers are distrustful of “foreign-made” AI (Abendroth-Dias 2025; Dreksler et al. 2025). The report discusses this dilemma.

Fourth, a growing number of governments are adopting sovereign AI strategies, which could reduce trade in AI as well as the benefits of AI to the world. Policy makers fear becoming too dependent on other countries for access to AI or its components (Alduhishy 2024; Aaronson 2024a). For example, Dutch officials expressed concerns that they are creating a national security risk by relying on US firms for AI infrastructure (Government of the Netherlands 2024, 14). Australian officials expressed similar concerns (Bell, Burgess and Sadiq 2023). In October 2025, the *Financial Times* reported that the European Union is planning a new AI sovereignty strategy to avoid “external dependencies of the AI stack” — the infrastructure and software needed to build, train and manage AI applications — which EU officials fear “can be weaponised” by both “state and non-state actors” (Moens and Foy 2025), posing a risk to supply chains. Moreover, in the wake of the bullying by and disinterest in trustworthy AI from US President Donald Trump's administration, European countries and governments are increasingly concerned about relying on cloud services owned or provided by US companies (Burgess 2025). The WTO does not address this problem.

Fifth, AI, like many technologies, comes with significant costs and benefits for society. AI may increase productivity, boost economic growth

and lift incomes. However, it could also wipe out millions of jobs and widen inequality, reshaping the global economy (Georgieva 2024; Acemoglu and Restrepo 2018a, 2018b). In countries such as the United States where AI and other data-driven technologies are a leading sector of the economy, workers are receiving less of the rents, and major shareholders more of the profits, from AI. As firms rely on AI rather than skilled workers, consumers may become less willing to pay for unskilled intensive goods, which could lead to lower prices for such goods, many of which are produced in the developing world (Caliendo, Dvorkin and Parro 2019). Nobel Prize-winning economist Daron Acemoglu (2025) warns that governments will be challenged to simultaneously encourage productivity-enhancing uses of AI and a more equitable distribution of political power and economic gains. At the same time, AI could improve how we conduct science and help researchers achieve results in fields as diverse as biology, medicine, neuroscience, and poverty and development (Amodei 2024). Nonetheless, many scholars are more skeptical of these potential economic and societal benefits (Acemoglu, in an interview with Nathan 2024; Crockett 2025; Yglesias 2023). No one yet knows the most effective ways to balance these costs and benefits at the national or international levels. However, the nation that figures out how to achieve this balance will obtain significant trade benefits.

Sixth, there are many different types of AI, as well as strategies for developing these AI variants. Some analysts are now questioning whether the United States has the best model for building AI. In 2023, the US Federal Trade Commission reported that only 20 firms possess the cloud infrastructure, computing power, capital and vast troves of data needed to create the large language models (LLMs) that underpin foundation models (Staff in the Bureau of Competition & Office of Technology 2023). But DeepSeek has shown that foundation models can be produced more cheaply and efficiently. DeepSeek did not produce the most capable AI model, but it created a more energy- and capital-efficient process for the development of such a model (Sheehan and Singer 2025; Arun Rai, in an interview with Georgia State University 2025). Other AI developers are closely monitoring new ways to create AI, including federated learning, which allows training to be spread across hundreds of computers connected over the internet while keeping data local and

⁷ See Murgia, Waters and Olcott (2025); on the UAE, see Cornish (2024); on European AI competitors, see Manuel (2024); see also *Financial Times* Editorial Board (2025).

private (Knight 2025). Here again, if a Chinese company can achieve such cost advantages, it will have important implications for AI.

Seven, there seems to be a growing perception that open-source models may be the most useful in fostering both innovation and trust in the model. Developers of open models generally provide information to their stakeholders about the model, the underlying data, the algorithm and the model weights (distillations of knowledge that govern how a model behaves). Open-source models make it easy for outsiders to view the model and improve it, fostering innovation and building trust (Aaronson 2024a). It may also make it easier for policy makers to assess AI safety and model claims (*The Economist* 2024; Roy-Chowdhury 2023; Edmond 2025). The Chinese government has been promoting the benefits of its models, including DeepSeek, which it claims are open source (although DeepSeek executives are not open about the provenance of the data they utilized).⁸

Finally, the context in which trade is conducted is changing and long-standing norms, rules and institutions such as the WTO are under threat from members who ignore dispute settlement body decisions or openly flout the rules. There is no easy explanation for this change. The United States provides a good example. In 1947–1948, the United States led global efforts to develop the General Agreement on Tariffs and Trade (GATT) and later the WTO in 1995. The GATT was essentially a club whose members agreed to adhere to its binding and aspirational rules. By the 1980s, the United States and other nations recognized that GATT could not effectively govern trade without a more comprehensive structure and a binding system of dispute settlement. However, once China joined the WTO in 2001, some US officials began to regret that binding system. Michael B. G. Froman, president of the Council on Foreign Relations, stated that instead of the rules-based order changing China after it joined the WTO, countries such as the United States became more like China in order to compete with China. He argued that “Washington is already living in Beijing’s world” (Froman 2025). In addition, under President Trump, the United States has put tariffs on products produced by many of its closest allies in North America, Asia and Europe, which is leading to boycotts of US goods and services (Burgess 2025;

Gross 2025). Trump’s bullying and actions violate US obligations in trade agreements, including the WTO and the United States-Mexico-Canada Agreement (USMCA) (Becker 2025; Riley 2025).

For these many reasons, perhaps it is not surprising that AI is not always encouraging trade, and that existing trade institutions may not be appropriate to govern how AI affects trade.

Key Points Put Forward by the WTO Report

The WTO Secretariat published *Trading with intelligence: How AI shapes and is shaped by trade* at year-end 2024. The WTO Secretariat said it wanted to “stimulate a discussion on how the WTO can promote the development and deployment of AI and help mitigate its associated risks and looming concerns about regulatory fragmentation” (WTO Secretariat 2024, 5).

The report has five chapters: an introduction, a chapter examining why AI is a trade issue, a chapter focusing on AI and trade policies, a chapter on the role of the WTO and a concluding chapter. The WTO team’s text is clearly written and almost always even-handed. But from the first pages to the end, the authors admit that they do not know how to regulate the trade spillovers of AI in a comprehensive fashion. They write that “AI is a general-purpose technology with wide current and potential applications” and argue this means it can be used for both good and harmful purposes (*ibid.*, 15). Because these systems can make “significant, continual improvements to their performance,” regulators cannot keep up: “AI’s inherent complexity and opacity and its potential failures and biases create challenges for regulators” (*ibid.*, 17).

The authors next turn to an analysis of how AI might affect trade. The list below delineates some of the key findings.

→ “Rapid advances in AI are expected to reduce trade costs, boost productivity and innovation, and reshape economies’ comparative advantages” (*ibid.*, 12). The WTO Secretariat expects that AI systems will alter supply chain

8 On DeepSeek, see <https://github.com/deepseek-ai/DeepSeek-V3>.

management by making exporters more efficient and eliminate language barriers by providing real-time transaction. It will also make it easier for firms to find trade partners (ibid., 18).

- Developing countries will benefit in several ways. AI-enabled cost reductions will make it easier for developing countries to access general markets and participate in trade (ibid., 21). The report does not note that these countries will likely have to import AI services to ensure that they can maintain trade competitiveness and increase the diversification of trade. At the same time, the Secretariat asserted that AI adaptation will boost productivity in developing and developed economies alike (ibid., 28-29). Nonetheless, the ability to leverage AI for development depends on member states' willingness to enhance digital infrastructure, upgrade skills and boost innovation and regulatory capabilities. In addition, "directing AI innovation toward benefiting the productivity of middleskilled workers could further help lower-income economies to close the trade and income gap" (ibid., 33).
- The "most significant trade impact of AI will be on trade in services," because AI will augment worker productivity in services such as finance, management, information services, and professional, science and technical services (ibid., 23). In particular, AI will "boost demand for computer and telecommunications services... as well as cross-border trade and investment in these sectors" (ibid., 25). However, most developing countries do not have comparative advantage in these sectors.
- By increasing demand for data, AI will reshape "the landscape of data usage and trade" (ibid., 27).

Then the report authors examine the key policy considerations governments must weigh, including:

- the growing AI and infrastructure divide, which could be exacerbated by government subsidies (ibid., 36);
- gaps in AI expertise, noting that professionals with AI expertise are mainly located in Europe and North America and are predominantly male (ibid., 38); and
- the concentration of AI within certain economies and firms because of network effects, which, in

turn, increases the risks of collusion and new challenges for competition authorities (ibid., 38-39).

The authors acknowledge that the WTO does not have the ability to address these problems systemically.

The WTO report then turns to various types of barriers to trade in AI and, in particular, the data that underpins it. Its authors note that cross-border data flow restrictions can impact AI innovation and raise costs. They also note that the large data sets required raise privacy concerns, which, in turn, are leading to a patchwork of data protection and privacy rules. Finally, they describe how restrictions on cross-border data flows also negatively impact trade in AI-enabled products (ibid., 40-41). The authors next explain why it is hard to ensure the trustworthiness of AI without hampering trade, noting that regulating AI means regulating a product's behaviour, even though the reason for that behaviour is opaque (ibid., 42-44). AI may cause a wide range of risks, and it is hard to know whether the firm or the technology (or both) is complying with various approaches to governance as AI evolves (ibid.).

The sections below highlight three areas where the WTO could provide further clarity to the relationship between AI and trade: the regulation of AI and data; the regulation of the free flow of data across borders and the exceptions to those rules; and ideas as to how the WTO might facilitate the dispersion of AI. Other important areas of concern, such as AI's role in conflict and national security, intellectual property (IP) rights, standards and competition policy, are outside the scope of this review.

Areas of Incomplete Analysis

Regulation and Regulatory Fragmentation

The Problem

As noted earlier, it is not easy to regulate AI development and deployment across borders.

Regulators want to simultaneously promote innovation and protect individuals from immediate and future harms. But there is no consensus among policy makers or AI developers on how to regulate AI. Should policy makers regulate the technology, the business practices, the AI supply chain, the uses and specific types of AI? How do you regulate a system that is constantly changing?

Discussion

As governance scholar Emily Jones (2023, 71) notes, “AI policies implemented by one government may be viewed as an unjustified barrier to trade, a threat to national security, or infringement of fundamental rights by another; divergent regulatory approaches across jurisdictions pose inter-operability challenges and increase compliance costs for international firms; and new cross-border mechanisms are needed to ensure that digital markets are competitive, and to uphold rights of consumers and workers engaging in cross-border transactions.”

Policy makers must find ways to govern AI while preserving the regulatory autonomy of states, so that each nation can maintain and adopt measures that reflect their public policy objectives in the broader domain of data governance. The WTO allows members to promote innovation while attempting to minimize the risks associated with the use of data-driven technologies such as AI (Burri and Kugler 2024). These rules recognize the right of states to regulate non-economic issues, such as protection of health, human life, personal data and the environment, through exceptions, as long as domestic regulation does not constitute an unnecessary barrier to trade or disguised protectionism (Soprana 2024).

The European Union and China have the most extensive and direct AI regulations (see, respectively, European Parliament 2023; White & Case 2025). But the WTO has not examined their trade spillovers. The WTO report writers note that AI may also be “intrinsicly prone to regulatory fragmentation” because it is hard for legislators to agree on “common international denominators” (WTO Secretariat 2024, 44). This could “result in high regulatory compliance burdens or costs, and consequently create non-tariff barriers to trade” (ibid.). Moreover, “as AI technologies become increasingly embedded in goods and services across a wide range of sectors...costs and other negative impacts are likely to grow significantly” (ibid., 50).

The report’s authors outlined ways that the WTO might help minimize negative international spillovers of regulation. They call for international regulatory cooperation (as in many digital trade agreements [DTAs]). The authors assert that the WTO’s Agreement on Technical Barriers to Trade (TBT Agreement) is a venue where AI regulators might seek guidance. The TBT Agreement states that when regulating, the approach shall not be discriminatory or more trade restrictive than necessary. The TBT Agreement is particularly suitable in relation to fast-evolving technologies such as AI and has been used to discuss issues of cybersecurity and source code transparency (ibid., 77). In addition, the WTO Secretariat notes that the WTO’s Agreement on Subsidies and Countervailing Measures might help member states challenge trade distortions from subsidies, which can be challenged in WTO dispute settlement (ibid., 78). However, some scholars disagree — they do not think WTO members could use this agreement to discipline subsidies for the many different categories of AI, because many of these subsidies were for R&D or education purposes (Soprana 2024). According to the US government, “subsidies provided for certain industrial research and development, regional development and environmental compliance purposes are both permitted and non-actionable (‘green light’) practices, so long as such government assistance is provided according to the strict conditions and criteria stipulated in the Agreement” (U.S. Department of Commerce 1999).

Due process, even-handedness and transparency are important metrics for good governance and are also norms of the WTO.⁹ But it is not easy to apply these norms to the governance of AI and trade. AI is developed in an opaque manner, and users have little understanding of how AI makes either decisions or predictions. So, AI developers, deployers and governors must find ways to signal that their variants of AI are trustworthy (Park and Yoon 2024; Afroogh et al. 2024). One way is to give individuals a voice in the development of AI systems and their governance — a participatory approach (Aaronson and Zable 2023).

However, the WTO, as an organization of member states, is not well suited to regulating participatory approaches to examining AI and trade. Individuals can only directly influence

⁹ See www.wto.org/english/thewto_e/whatis_e/tif_e/fact2_e.htm.

WTO deliberations by influencing their home governments. These home governments must connect with their citizens and be responsive to their concerns, as officials communicate what their government is doing to set rules governing trade and why their government is acting.¹⁰

Data Governance Within and Among Nations

The Problem

Data is not explicitly discussed in the WTO agreements, and many researchers question whether trade agreements such as those of the WTO should regulate the data that undergirds AI. Yet some nations want to include explicit language governing cross-border data flows under the WTO. The *Trading with intelligence* report briefly discusses some of the questions raised by efforts to include data governance in trade agreements.

Discussion

There is no AI without data. Cross-border data flows can help ensure that data sets are built on more globally complete and more accurate data sets. However, so far, the members of the WTO have not found common ground on how to govern various types of data. Data governance is fragmented, and some governments will not allow cross-border data exchange for certain types of data. Without shared rules, the cross-border exchange of data is hampered by differing approaches and restrictions to data privacy, data sharing and the reuse of government or government-funded data. But if governments reduced or eliminated these rules designed to protect users or various types of data, these same governments would find user trust in data would decline. A joint study by the OECD and the WTO estimated that global GDP would fall by nearly one percent, and global exports by just over two percent. The impacts would be largest for high-income economies, which could see their GDP fall by more than two percent. Ironically, the organizations found that trade agreements, which are supposed to build trust among market actors, may actually undermine trust in the data that underpins AI (Andrenelli et al. 2024). It is a difficult balance, yet nations should make it a priority to encourage

the data sharing that underpins AI with the data protection that underpins trust in data and AI.

Moreover, as trade and governance scholar Patrick Leblond (2024, 95) notes, “the following three elements cannot hold simultaneously: free flow of data across borders; national data protection laws and regulations that are distinct from those of other countries; and a high level of trust in the data environments among individuals, consumers, businesses and governments. Only two of the three elements can occur at the same time.” If policy makers want to ensure the free flow of data across borders while maintaining national data policies, they may have to accept weaker data protection measures, which could negatively affect trust. Finally, “if policy makers want data to flow freely across borders while ensuring a high degree of trust surrounding the collection and use of data, then they either adopt another jurisdiction’s regulatory standards (in order for data to flow freely with this jurisdiction and others with the same recognized standards), or they cooperate with governments in other countries to develop and enforce common, high-quality protection standards and regulations for personal as well as non-personal data” (ibid.). Leblond calls this the data governance trilemma.

But data governance is quite different from other types of governance, because data is not only a commercial asset. Access to information (including data) is a fundamental human right, which governments must respect. When states restrict the free flow of data, they reduce access to information, which, in turn, can diminish economic growth, productivity and innovation, both domestically and globally (Aaronson 2018a, 2018b). As they do with any set of rules, policy makers have put in place exceptions. Under the Universal Declaration of Human Rights, governments can restrict access to information in order to protect the rights or reputations of others, national security and public order, and public health or morals.¹¹ The WTO and most other trade agreements include such exceptions.

Data does not fit neatly into the goods and services rulebook discussed in most trade agreements.

¹⁰ See www.wto.org/english/news_e/news17_e/minis_12dec17_e.htm.

¹¹ The limitations on freedom of expression are spelled out in article 19(3) of the International Covenant on Civil and Political Rights, one of the two covenants in the Universal Declaration of Human Rights. See *International Covenant on Civil and Political Rights*, 16 December 1966, art 19(3) (entered into force 23 March 1973). See ARTICLE 19, “Limitations,” and www.article19.org/explore/#_ftn9.

While data has long moved across borders, some of that exchange occurs without a transaction. As a result, it does not quite fit under the definition of “trade,” raising questions as to whether trade agreements are an appropriate place to govern the data that bolsters AI. Moreover, trade in the same set of data can occur repeatedly in nanoseconds. Consequently, researchers and policy makers may find it hard to determine when data is exported or imported. They also struggle to ascertain when data is subject to domestic law (such as IP law) and what type of transborder enforcement is appropriate. Economists generally agree that many types of data are public goods, which governments should provide and regulate effectively. But nations have different definitions and priorities for providing such public goods. As an example, some states hoard data or limit its access. For these reasons, some observers question whether the WTO and other trade agreements are the right place to govern the data and data flows that underpin AI (ibid.).

Since 2017, under the so-called Joint Statement Initiative on Electronic Commerce, some 70 members of the WTO have been negotiating language on data issues, including how to share open government data, facilitate cross-border data flows, and incentivize AI and other data-driven technologies. As of June 25, 2024, 91 WTO members, accounting for more than 90 percent of global trade, participated in these discussions.¹² In July, the participants released what they called a stabilized text, the Agreement on Electronic Commerce,¹³ which did not include any language on the free flow of data or on strategies to make AI or data governance interoperable so that data could more easily cross borders. However, the stabilized text addresses a long-standing US objective: making public data open, reusable and readily available in a machine-readable format (see Box 1).

Other trade agreements are more explicit about both enabling cross-border data flows and clarifying how and when nations can limit the free flow of data to achieve important regulatory goals. For example, in article 14.11(3), the Comprehensive and Progressive Agreement for Trans-Pacific Partnership allows parties to maintain data localization measures to achieve a

legitimate public policy objective, as long as the measure “does not impose restrictions on the use or location of computing facilities greater than are required to achieve the objective.” If a nation wanted to challenge another nation’s use of the exception, they must engage in a trade dispute.¹⁴ In a recent UK free trade agreement with Australia, for example,¹⁵ the digital trade chapter states “the Parties recognize that each Party may have its own regulatory requirements concerning the transfer of information by electronic means,” but “neither Party shall prohibit or restrict the cross-border transfer of information by electronic means, including personal information, if this activity is for the conduct of the business of a covered person.” Moreover, “nothing in this Article shall prevent a Party from adopting or maintaining measures inconsistent with paragraph 2 to achieve a legitimate public policy objective, provided that the measure is not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination, or a disguised restriction on trade; and (b) does not impose restrictions on transfers of information greater than are required to achieve the objective.” In another example, the 2024 EU-Singapore DTA “facilitates cross-border data flows by prohibiting unjustified data localisation requirements to prevent data being transferred out or into the territory of a Party. This covers all sectors of the economy, including both personal and industrial data. However, the agreement expressly preserves the EU’s high level of protection for personal data and privacy. Both the EU and Singapore may adopt and maintain safeguards to protect personal data and privacy. It also does not prevent the EU or Singapore from adopting or maintaining a necessary and proportionate measure to achieve a legitimate public policy objective.”¹⁶ Should they choose, the members of the WTO could easily build on this language.

But for the WTO to succeed at including free flow and data governance provisions, it must have

12 See www.wto.org/english/tratop_e/ecom_e/joint_statement_e.htm.

13 The text, identified as INF/ECOM/87, is downloadable from the WTO website at www.wto.org/english/tratop_e/ecom_e/joint_statement_e.htm.

14 *Comprehensive and Progressive Agreement for Trans-Pacific Partnership*, 8 March 2018, arts 14.11–14.13 (entered into force 30 December 2018), online: <www.dfat.gov.au/sites/default/files/14-electronic-commerce.pdf>.

15 *Free Trade Agreement between the United Kingdom of Great Britain and Northern Ireland and Australia*, 17 December 2021, c 14 (entered into force 31 May 2023), online: <www.gov.uk/government/publications/uk-australia-fta-chapter-14-digital-trade>.

16 See https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/singapore/eu-singapore-agreements/agreements-explained_en.

Box 1: From WTO Agreement on Electronic Commerce, Article 12 – Open Government Data

- 12.4 The Parties recognize that facilitating public access to and use of government data fosters economic and social development, competitiveness, and innovation. To this end, the Parties are encouraged to expand the coverage of such data, such as through engagement and consultation with interested stakeholders.
- 12.5 To the extent that a Party chooses to make government data digitally available for public access and use, it shall endeavour...to ensure that such data is:
- (a) made available in a machine-readable and open format;
 - (b) searchable and retrievable;
 - (c) updated, as applicable, in a timely manner;
 - (d) accompanied by metadata that is, to the extent possible, based on commonly used formats that allow the user to understand and utilize the data; and
 - (e) made generally available at no or reasonable cost to the user.
- 12.6 To the extent that a Party chooses to make government data digitally available for public access and use, it shall endeavour to avoid imposing conditions that unduly prevent or restrict the user of such data from:
- (a) reproducing, redistributing, or republishing the data;...
- 12.7 The Parties shall endeavour to cooperate on matters that facilitate and expand public access to and use of government data, including exchanging information and experiences on practices and policies, with a view to encouraging the development of electronic commerce and creating business opportunities, particularly for MSMEs [micro, small and medium-sized enterprises].

Source: <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/INF/ECOM/87.pdf&Open=True>.

the support of the trade hegemons — China, the European Union and the United States. As noted above, in 2024 the European Union completed its first DTA with Singapore. In 2025, it negotiated another with Korea. Both must be approved by the European Parliament.¹⁷ In 2024, China, a nation with a “Great Firewall,” claimed to have become an advocate for the free flow of data (U.S.-China Economic and Security Review Commission 2022). In November 2024, Chinese President Xi Jinping announced the launch of a “Global Cross-Border Data Flow Cooperation Initiative” while attending the Asia-Pacific Economic Cooperation leaders’ meeting in Lima, Peru. The initiative is designed to position China as an advocate of cross-border data flows, openness and open-source technologies. At bottom, the initiative makes it easier to transfer many types of data, but not sensitive personal

data. China has also applied to join various trade agreements with binding provisions on digital trade, such as the Digital Economy Partnership Agreement (DEPA).¹⁸ But the United States seems to have lost its enthusiasm for binding language on the free flow of data and on open data. In the first years of the twenty-first century, the United States was the leading *demandeur* of such provisions, but it has not signed a DTA since 2019 (when it signed the USMCA and the US-Japan DTA).¹⁹ Instead, the United States has focused on domestic laws, executive orders and regulations. In April 2024, Congress passed, and the president signed, the Protecting Americans’ Data from Foreign Adversaries Act, which prohibits data brokerage transactions with foreign adversaries related to US citizens’ personally identifiable sensitive

17 See https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/south-korea/eu-south-korea-agreements_en.

18 See Mok (2025); Li (2024). On DEPA, see *Global Times* (2024).

19 See <https://ustr.gov/issue-areas/services-investment/telecom-e-commerce/e-commerce-fta-chapters>.

data.²⁰ In December 2024, the US Department of Justice issued a final rule designed to restrict the sale of personal data to China, Iran, North Korea and Russia. While policy makers' desire to protect American personal data is understandable, it could have spillovers for AI.²¹ Without further agreements governing data, US companies might struggle to sustain their competitiveness, as their data is likely to be less accurate, complete and representative.

Meanwhile, in this author's view, the Trump administration appears unenthusiastic about the WTO as a venue to discuss trade or to negotiate trade agreements, including those relevant to AI (Farge 2025).

Final Thoughts

Ten years ago, the noted trade scholars Petros C. Mavroidis and Robert Wolfe wrote an influential analysis of trade policy transparency. They concluded that "trade policy information is a public good," but it would "be under-provided" (Mavroidis and Wolfe 2015). The WTO report gave us a significant amount of information about how trade is changing AI and how AI is affecting trade. However, this reader hoped to gain a better understanding of how the WTO might evolve to ensure that AI and its supply chain are governed in a transparent, equitable and interoperable manner.

In recognition of the need for fresh ideas, a few suggestions follow.

- To build trust in the role of the WTO as a means of encouraging and governing AI, policy makers should seek the advice of outsider organizations with credibility on issues of concern such as privacy or competition policy. Law professors Anupam Chander and Paul Schwartz advocate that the WTO task an organization such as the Global Privacy Assembly to suggest shared

global privacy norms, just as the Codex Alimentarius Commission, established by the Food and Agriculture Organization and the World Health Organization in 1963, set the international standards for food safety (Chander and Schwartz 2023). If nations could agree to such shared norms, we would no longer have the data governance privacy trilemma, which could facilitate AI.

- The WTO Secretariat might work with its partners in trade research, the United Nations Conference on Trade and Development and the OECD, to provide guidance on important questions in AI development, such as whether AI developers can scrape (or buy web scrapings) to create a sufficient supply of global data.²² Since 2020, at the behest of the Group of Twenty, these organizations prepare periodic reports on policy impediments to trade. They could also examine the implications for science and innovation of data sovereignty and hoarding at the firm and governmental levels. Such research could be part of a broader endeavour to examine how impediments to the free flow of data might affect national and international efforts to promote AI (Cormann, Okonjo-Iweala and Grynspan 2024).
- Many developing countries do not have the expertise or means to create their own LLMs or the international clout to ensure that their data is utilized in ways that reflect their culture and benefit their people. The WTO could help developing countries benefit from AI by helping them to collect, utilize and share their unique national data sets. Several governments have announced that they would create an LLM to stimulate economic growth and to utilize and preserve their nation's data and culture (for example, Ukraine [Ukrainian National News 2025]). Kazakhstan also created its own LLM, designed to process and generate text in Kazakh, Russian, English and Turkish languages (Barnes

20 The law is included in US, Bill HR 185, *Making emergency supplemental appropriations for the fiscal year ending September 30, 2024, and for other purposes*, 118th Cong, 2023–2024 (enacted), online: <www.congress.gov/bill/118th-congress/house-bill/815/text>.

21 *Preventing Access to U.S. Sensitive Personal Data and Government-Related Data by Countries of Concern or Covered Persons*, 28 CFR Part 202, 90 Fed Reg 1636 (2025), online: <www.federalregister.gov/documents/2025/01/08/2024-31486/preventing-access-to-us-sensitive-personal-data-and-government-related-data-by-countries-of-concern>.

22 Generative AI systems are trained using extremely large data sets. These are created from two types of data: first, proprietary data that may include personal and copyrighted information from sources collected and controlled by the AI developer, and second, web-scraped data. Developers may not have direct consent to utilize some of the web-scraped personal and proprietary data. Some sites are making it harder for outsiders such as AI companies to scrape them or to scrape them without compensation (Aaronson 2024b). Some governments see such scraping as perfectly legal reuse of data to create new ideas, while others are changing IP policy rules to facilitate the use of copyrighted data. But these solutions are national. The WTO might be the institution best positioned globally to weigh the implications of web scraping for the health of AI and the borderless internet.

2025). Building on this need, the WTO could develop a library of developing country data from countries with relatively small populations whose languages may be underutilized by many AI developers: an international data library. The idea of a national data library was first suggested by the United Kingdom's Tony Blair Institute for Global Change, "to establish a clear, secure way to access linked data sets, supporting AI innovation, better policymaking and research that drives economic growth. It will not centralise data but will put in place the legal, technical and governance structures to ensure that high-value data sets can be used efficiently while maintaining security and trust" (Li et al. 2025). Such a shared approach could create economies of scale and scope, facilitate data use and illuminate the value of data. Moreover, it could be perceived as an extension of the WTO transparency and statistical function.

trade. To its credit, the WTO Secretariat sought to illuminate the issues; it is up to member states to put forward shared norms, strategies and rules. But as of this writing, the members of the WTO are not ready to begin these discussions.

- The members of the WTO could use transparency to facilitate greater understanding of global data markets. The market for data is opaque, and AI developers provide little information about how they obtain the data they use for AI. Greater transparency is in everyone's interest, as it is likely to reduce costs and duplication and to spur innovation. It enhances the accountability of policy makers and should also improve the credibility of their policies (International Monetary Fund Staff 2001). WTO members could use the trade policy review process to ask what countries are doing to ensure that the firms that develop and deploy AI provide information about data provenance (where and how the firms collected data) and AI governance. According to the WTO, trade policy reviews focus on members' own trade policies and practices and the wider economic context. The WTO argues that these "peer reviews" by other WTO members encourage governments to follow more closely the WTO rules and disciplines and to fulfill their commitments. They also enable outsiders to understand a country's policies and circumstances, and they provide feedback to the reviewed country on its performance in the system.²³

In sum, AI presents a huge challenge to the trading system. It could supercharge trade or reduce the willingness of nations to engage in

²³ See www.wto.org/english/thewto_e/whatis_e/tif_e/agrm11_e.htm.

Works Cited

- Aaronson, Susan Ariel. 2018a. *Data Is Different: Why the World Needs a New Approach to Governing Cross-border Data Flows*. CIGI Paper No. 197. Waterloo, ON: CIGI. www.cigionline.org/publications/data-different-why-world-needs-new-approach-governing-cross-border-data-flows/.
- . 2018b. “Data Minefield? How AI Is Prodding Governments to Rethink Trade in Data.” In *Data Governance in the Digital Age*, 104–109. Waterloo, ON: CIGI. www.cigionline.org/publications/data-governance-digital-age/.
- . 2023. *Could a Global “Wicked Problems Agency” Incentivize Data Sharing?* CIGI Paper No. 273. Waterloo, ON: CIGI. www.cigionline.org/publications/could-a-global-wicked-problems-agency-incentivize-data-sharing/.
- . 2024a. *The Age of AI Nationalism and Its Effects*. CIGI Paper No. 306. Waterloo, ON: CIGI. www.cigionline.org/publications/the-age-of-ai-nationalism-and-its-effects/.
- . 2024b. “Data Governance Is Not Ready for AI.” In *The Role of Governance in Unleashing the Value of Data*, 15–23. Waterloo, ON: CIGI. www.cigionline.org/the-role-of-governance-in-unleashing-the-value-of-data/.
- Aaronson, Susan Ariel and Adam Zable. 2023. *Missing Persons: The Case of National AI Strategies*. CIGI Paper No. 283. Waterloo, ON: CIGI. www.cigionline.org/publications/missing-persons-the-case-of-national-ai-strategies/.
- Aarup, Sarah Anne. 2023. “Reform or die? If the US gets its way, the WTO might do both.” *Politico*, May 9. www.politico.eu/article/reform-die-usa-washington-world-trade-organization-wto-ngozi-okonjo-iweala-joe-biden/.
- Abendroth-Dias, Kulani. 2025. “What’s Risk Got to Do with It? Public Attitudes Toward AI Regulation in the European Union and United States.” In *Oxford Intersections: AI in Society*, edited by Philipp Hacker. Online ed. Oxford, UK: Oxford Academic. <https://doi.org/10.1093/9780198945215.001.0001>.
- Acemoglu, Daron. 2025. “Nobel Lecture: Institutions, Technology, and Prosperity.” *American Economic Review* 115 (6): 1709–48. <https://doi.org/10.1257/aer.115.6.1709>.
- Acemoglu, Daron and Pascual Restrepo. 2018. “The Race between Machine and Man: Implications of Technology for Growth, Factor Shares, and Employment.” *American Economic Review* 108 (6): 1488–542. www.aeaweb.org/articles?id=10.1257/aer.20160696.
- . 2018b. “Modeling Automation.” In *AEA Papers and Proceedings* 108: 48–53. www.aeaweb.org/articles?id=10.1257/pandp.20181020.
- Afroogh, Saleh, Ali Akbari, Evan Malone, Mohammadali Kargar and Hananeh Alambeigi. 2024. “Trust in AI: Progress, Challenges, and Future Directions.” Preprint, arXiv, April 4. <https://arxiv.org/abs/2403.14680>.
- Ahmed, Usman and Penelope Naas. 2024. “ChatWTO: An Analysis of Generative Artificial Intelligence and International Trade.” White Paper, September 4. Geneva, Switzerland: World Economic Forum. www.weforum.org/publications/chatwto-an-analysis-of-generative-artificial-intelligence-and-international-trade/.
- Alduhishy, Muath. 2024. “Sovereign AI: What it is, and 6 strategic pillars for achieving it.” *World Economic Forum*, April 25. www.weforum.org/stories/2024/04/sovereign-ai-what-is-ways-states-building/.
- Amodei, Dario. 2024. “Machines of Loving Grace: How AI Could Transform the World for the Better.” October. <https://darioamodei.com/machines-of-loving-grace>.
- Andrenelli, A., E. Bekkers, J. Lopez-Gonzalez, G. Marceau and R. So. 2024. “A Song of Data Flows and Trust: A Quantitative Analysis of Cross-Border Data Flow Regulation.” WTO-OECD Working Paper presented at the Bank of Italy’s G7 Roundtable, June 3.
- Andrews, Caitlin. 2025. “How DPAs are trying to keep up with AI advances.” *International Association of Privacy Professionals*, February 26. <https://iapp.org/news/a/how-dpas-are-trying-to-keep-up-with-ai-advances/>.
- Anthis, Jacey Reese, Ryan Liu, Sean M. Richardson, Austin C. Kozlowski, Bernard Koch, James Evans, Erik Brynjolfsson and Michael Bernstein. 2025. “LLM Social Simulations Are a Promising Research Method.” Preprint, arXiv, June 5. <https://arxiv.org/abs/2504.02234>.
- Barnes, Joe Luc. 2025. “Kazakhstan’s Bid For AI Sovereignty.” *The Diplomat*, March 21. <https://thediplomat.com/2025/03/kazakhstans-bid-for-ai-sovereignty/>.
- Becker, Andreas. 2025. “Trump tariffs: Can US be punished for breaking trade laws?” *Deutsche Welle*, March 3. www.dw.com/en/can-us-be-punished-for-imposing-tariffs/a-71788197.
- Bell, G., J. Burgess, J. Thomas and S. Sadiq. 2023. *Rapid Response Information Report: Generative AI — language models (LLMs) and multimodal foundation models (MFMs)*. March 24. Canberra, Australia: Australian Council of Learned Academies. www.chiefscientist.gov.au/GenerativeAI.

- Brynjolfsson, Erik, Daniel Rock and Chad Syverson. 2021. "The Productivity J-Curve: How Intangibles Complement General Purpose Technologies." *American Economic Journal: Macroeconomics* 13 (1): 333–72. www.aeaweb.org/articles?id=10.1257/mac.20180386.
- Burgess, Matt. 2025. "Trump's Aggression Sours Europe on US Cloud Giants." *Wired*, March 24. www.wired.com/story/trump-us-cloud-services-europe/.
- Burri, Mira and Kholofelo Kugler. 2024. "Regulatory autonomy in digital trade agreements." *Journal of International Economic Law* 27 (3): 397–423. <https://doi.org/10.1093/jiel/jgae025>.
- Caliendo, Lorenzo, Maximiliano Dvorkin and Fernando Parro. 2019. "Trade and Labor Market Dynamics: General Equilibrium Analysis of the China Trade Shock." *Econometrica* 87 (3): 741–835. <https://doi.org/10.3982/ECTA13758>.
- Chan, Kelvin. 2024. "These countries have already banned TikTok." *PBS News*, April 26. www.pbs.org/newshour/world/these-countries-have-already-banned-tiktok.
- Chander, Anupam and Paul M. Schwartz. 2023. "Privacy and/or Trade." *University of Chicago Law Review* 90 (1): 49–135. <https://chicagounbound.uchicago.edu/uclev/vol90/iss1/2/>.
- Chuang, Chih-wei. 2025. "VOA Mandarin: China's DeepSeek banned by several countries out of censorship fear." *Voice of America News*, February 7. www.voanews.com/a/voa-mandarin-china-s-deepseek-banned-by-several-countries-out-of-censorship-fear-/7965806.html.
- Ciuriak, Dan. 2024. "Technological Conditions and the Rise and Fall of the Rules-Based System." *Journal of Global Trade, Ethics and Law* 2 (1): 1–28. <https://doi.org/10.70150/4a5jcv40>.
- Cormann, Mathias, Ngozi Okonjo-Iweala and Rebeca Grynspan. 2024. "Reports on G20 Trade and Investment Measures (October 2023–October 2024)." OECD, WTO and United Nations Conference on Trade and Development Joint Summary on G20 Trade and Investment Measures, November 13. https://unctad.org/system/files/official-document/unctad_oecd2022d31_summary_en.pdf.
- Cornish, Chloe. 2024. "UAE seeks 'marriage' with US over artificial intelligence deals." *Financial Times*, June 4. www.ft.com/content/b72ba623-8e3c-4d29-837b-33f6b8407fb8.
- Crafts, Nicholas. 2021. "Artificial intelligence as a general-purpose technology: an historical perspective." *Oxford Review of Economic Policy* 37 (3): 521–36. <https://doi.org/10.1093/oxrep/grab012>.
- Crockett, M. J. 2025. "AI is 'beating' humans at empathy and creativity. But these games are rigged." *The Guardian*, March 1. www.theguardian.com/commentisfree/2025/feb/28/ai-empathy-humans.
- Dreksler, Noemi, Harry Law, Chloe Ahn, Daniel S. Schiff, Kaylyn Jackson Schiff and Zachary Peskowitz. 2025. "What Does the Public Think About AI? An overview of the public's attitudes towards AI and a resource for future research." Centre for the Governance of AI, January 22. https://cdn.governance.ai/What_does_the_public_think_about_AI.pdf.
- Edmond, Charlotte. 2025. "What is open-source AI and how could DeepSeek change the industry?" *World Economic Forum*, February 5. www.weforum.org/stories/2025/02/open-source-ai-innovation-deepseek/.
- European Parliament. 2023. "EU AI Act: first regulation on artificial intelligence." *Topics*, June 8. www.europarl.europa.eu/topics/en/article/20230601STO93804/eu-ai-act-first-regulation-on-artificial-intelligence.
- Farge, Emma. 2025. "Exclusive: US pauses financial contributions to WTO, trade sources say." *Reuters*, March 28. www.reuters.com/world/us-suspends-financial-contributions-wto-trade-sources-say-2025-03-27/.
- Financial Times Editorial Board. 2025. "The new AI arms race." *Financial Times*, February 12. www.ft.com/content/8daa9dd3-3ced-47b2-ad42-df5eb50fd062.
- Freund, Caroline. 2023. "Intersecting Paths: Advances in technology affect trade and vice versa." *Finance & Development*, June. Washington, DC: International Monetary Fund. www.imf.org/en/Publications/fandd/issues/2023/06/intersecting-paths-caroline-freund.
- Froman, Michael B. G. 2025. "China Has Already Remade the International System: How the World Adopted Beijing's Economic Playbook." *Foreign Affairs*, March 25. www.foreignaffairs.com/china/economics-china-international-system-tariffs-michael-froman.
- Georgia State University. 2025. "How Deepseek is Changing the AI Landscape." *Georgia State News Hub*, February 4. <https://news.gsu.edu/2025/02/04/how-deepseek-is-changing-the-a-i-landscape/>.
- Georgieva, Kristalina. 2024. "AI Will Transform the Global Economy. Let's Make Sure It Benefits Humanity." *IMF Blog*, January 14. www.imf.org/en/Blogs/Articles/2024/01/14/ai-will-transform-the-global-economy-lets-make-sure-it-benefits-humanity.

- Global Times. 2024. "China will accelerate negotiations with DEPA members to strive for achievements at early date: MOFCOM." *Global Times*, November 21. www.globaltimes.cn/page/202411/1323539.shtml.
- Goldfarb, Avi and Daniel Trefler. 2018. "AI and International Trade." National Bureau of Economic Research Working Paper 24254. Cambridge, MA: National Bureau of Economic Research. www.nber.org/papers/w24254.
- Government of the Netherlands. 2024. "Government-wide vision on generative AI of the Netherlands." January 17. The Hague, The Netherlands: Ministry of the Interior and Kingdom Relations. www.government.nl/documents/parliamentary-documents/2024/01/17/government-wide-vision-on-generative-ai-of-the-netherlands.
- Gross, Jenny. 2025. "America Last: Why Shoppers Abroad Are Boycotting U.S. Goods." *The New York Times*, March 21. www.nytimes.com/2025/03/21/world/europe/europe-boycott-american-products-trump.html.
- Humble, Kristian. 2024. "War, Artificial Intelligence, and the Future of Conflict." *Georgetown Journal of International Affairs*, July 12. <https://gjia.georgetown.edu/2024/07/12/war-artificial-intelligence-and-the-future-of-conflict/>.
- Ibison, Yasmin. 2023. "Artificial intelligence for public good." Joseph Rowntree Foundation, December 14. www.jrf.org.uk/ai-for-public-good/artificial-intelligence-for-public-good.
- International Monetary Fund Staff. 2001. "Transparency." Issues Brief, April. www.imf.org/external/np/exr/ib/2001/042601b.htm.
- International Committee of the Red Cross. 2023. "What you need to know about artificial intelligence in armed conflict." October 6. www.icrc.org/en/document/what-you-need-know-about-artificial-intelligence-armed-conflict.
- Jones, Emily. 2023. "Digital disruption: artificial intelligence and international trade policy." *Oxford Review of Economic Policy* 39 (1): 70–84. <https://doi.org/10.1093/oxrep/grac049>.
- Knight, Will. 2025. "These Startups Are Building Advanced AI Models Without Data Centers." *Wired*, April 30. www.wired.com/story/these-startups-are-building-advanced-ai-models-over-the-internet-with-untapped-data/.
- Kurtenbach, Elaine. 2024. "China bans exports to U.S. of key high-tech materials in response to chip sanctions." PBS News, December 3. www.pbs.org/newshour/world/china-bans-exports-to-u-s-of-key-high-tech-materials-in-response-to-chip-sanctions.
- Leblond, Patrick. 2024. "Trade Agreements and Data Governance." In *The Role of Governance in Unleashing the Value of Data*, 91–98. Waterloo, ON: CIGI. www.cigionline.org/the-role-of-governance-in-unleashing-the-value-of-data/.
- Li, Bob. 2024. "China Released New Regulations to Ease Requirements for Outbound Cross-Border Data Transfers." White & Case, April 2. www.whitecase.com/insight-alert/china-released-new-regulations-ease-requirements-outbound-cross-border-data-transfers.
- Li, Henry, Anastasia Bektimirova, Axel Heitmueller, Darcy Ward and Alexander Iosad. 2025. *Governing in the Age of AI: Building Britain's National Data Library*. February 25. Tony Blair Institute for Global Change. <https://institute.global/insights/tech-and-digitalisation/governing-in-the-age-of-ai-building-britains-national-data-library>.
- Manuel, Anja. 2024. "The US and Europe need a strategy for the geopolitical contest over AI." *Financial Times*, April 16. www.ft.com/content/95a4bd15-ed9b-4f06-a6be-a64ad0541c18.
- Martínez-Zarzoso, Immaculada and Daniela Arregui Coka. 2025. "Do trade agreements contribute to technology internationalization?" *The Journal of International Trade & Economic Development* 34 (7): 1829–71. <https://doi.org/10.1080/09638199.2025.2482549>.
- Mavroidis, Petros C. and Robert Wolfe. 2015. "From Sunshine to a Common Agent: The Evolving Understanding of Transparency in the WTO." *Brown Journal of World Affairs* 21 (2): 117–29. https://scholarship.law.columbia.edu/faculty_scholarship/773.
- Mishra, Saurabh, Robert Koopman, Giuditta De Prato, Anand Rao, Israel Osorio-Rodarte, Julie Kim, Nikola Spatafora et al. 2023. "AI specialization for pathways of economic diversification." *Scientific Reports* 13: 19475. <https://doi.org/10.1038/s41598-023-45723-x>.
- Moens, Barbara and Henry Foy. 2025. "EU pushes new AI strategy to reduce tech reliance on US and China." *Financial Times*, October 5. www.ft.com/content/ea3d20ed-5b42-45ce-8155-67ef472ae9df.
- Mok, Charles. 2025. "China Picked Up the Ball on Data Trade Where the US Dropped It in 2024." Tech Policy Press, January 22. www.techpolicy.press/china-picked-up-the-ball-on-data-trade-where-the-us-dropped-it-in-2024/.
- Mucci, Tim. n.d. "The future of AI: trends shaping the next 10 years." IBM. www.ibm.com/think/insights/artificial-intelligence-future.
- . n.d. "The history of artificial intelligence." IBM. www.ibm.com/think/topics/history-of-artificial-intelligence.

- Murgia, Madhumita, Richard Waters and Eleanor Olcott. 2025. "The global AI race: Is China catching up to the US?" *Financial Times*, January 31. www.ft.com/content/0e8d6f24-6d45-4de0-b209-8f2130341bae.
- Nathan, Allison. 2024. "A skeptical look at AI investment with Daron Acemoglu and Jim Covello," July 16, in *Goldman Sachs Exchanges*, produced by Goldman Sachs, podcast, 28:27. www.goldmansachs.com/insights/goldman-sachs-exchanges/a-skeptical-look-at-ai-investment.
- OECD. 2024. "Framework for Anticipatory Governance of Emerging Technologies." OECD Science, Technology and Industry Policy Paper No. 165. Paris, France: OECD Publishing. <https://doi.org/10.1787/0248ead5-en>.
- Park, Keonyoung and Ho Young Yoon. 2024. "Beyond the code: The impact of AI algorithm transparency signaling on user trust and relational satisfaction." *Public Relations Review* 50 (5): 102507. <https://doi.org/10.1016/j.pubrev.2024.102507>.
- Peng, Shin-yi, Ching-Fu Lin and Thomas Streinz, eds. 2021. *Artificial Intelligence and International Economic Law: Disruption, Regulation, and Reconfiguration*. Cambridge, UK: Cambridge University Press. <https://doi.org/10.1017/9781108954006>.
- Rebelo, Miguel. 2025. "The best AI chatbot in 2025." *Zapier* (blog), March 4. <https://zapier.com/blog/best-ai-chatbot/>.
- Reuters. 2024. "U.S. announces new export controls on China's chip industry." NBC News, December 3. www.nbcnews.com/news/world/us-announces-new-export-controls-china-chip-industry-rcna182579.
- Riley, Bryan. 2025. "Enforce U.S. Trade Rights by Taking Action at the WTO." National Taxpayers Union, March 6. www.ntu.org/publications/detail/enforce-us-trade-rights-by-taking-action-at-the-wto.
- Roy-Chowdhury, Rahul. 2023. "Why open-source is crucial for responsible AI development." World Economic Forum, December 22. www.weforum.org/stories/2023/12/ai-regulation-open-source/.
- Schneider-Petsinger, Marianne. 2020. "Reforming the World Trade Organization." (Updated September 14, 2022). London, UK: Chatham House. www.chathamhouse.org/2020/09/reforming-world-trade-organization/03-us-and-wto.
- Sheehan, Matt and Scott Singer. 2025. "What DeepSeek Revealed About the Future of U.S.-China Competition." *Foreign Policy*, February 3. <https://foreignpolicy.com/2025/02/03/deepseek-china-ai-artificial-intelligence-united-states-tech-competition/>.
- Shivakumar, Sujai, Charles Wessner and Thomas Howell. 2024. *Balancing the Ledger: Export Controls on U.S. Chip Technology to China*. Center for Strategic & International Studies, February 21. www.csis.org/analysis/balancing-ledger-export-controls-us-chip-technology-china.
- Soprana, Marta. 2024. "Compatibility of emerging AI regulation with GATS and TBT: the EU Artificial Intelligence Act." *Journal of International Economic Law* 27 (4): 706–22. <https://doi.org/10.1093/jiel/jgae040>.
- Spulber, Daniel F. 2008. "Innovation and international trade in technology." *Journal of Economic Theory* 138 (1): 1–20. <https://doi.org/10.1016/j.jet.2007.06.002>.
- Staff in the Bureau of Competition & Office of Technology. 2023. "Generative AI Raises Competition Concerns." *Federal Trade Commission Technology Blog*, June 29. www.ftc.gov/policy/advocacy-research/tech-at-ftc/2023/06/generative-ai-raises-competition-concerns.
- The Economist*. 2024. "Why open-source AI models are good for the world." November 7. www.economist.com/leaders/2024/11/07/why-open-source-ai-models-are-good-for-the-world.
- Tobin, Meaghan, Paul Mozur and Alexandra Stevenson. 2025. "DeepSeek's Rise: How a Chinese Start-Up Went From Stock Trader to A.I. Star." *The New York Times*, January 28. www.nytimes.com/2025/01/28/business/deepseek-owner-china-ai.html.
- Ukrainian National News. 2025. "Ukraine will create the first national large language model based on AI." March 28. <https://unn.ua/en/news/ukraine-will-create-the-first-national-large-language-model-based-on-ai>.
- U.S.-China Economic and Security Review Commission. 2022. "China's Evolving Data Governance Regime." July 26. www.uscc.gov/research/chinas-evolving-data-governance-regime.
- U.S. Department of Commerce. 1999. *Report to the Congress: Review and Operation of the WTO Subsidies Agreement*. Report of the U.S. Department of Commerce. June. <https://enforcement.trade.gov/esel/reports/scm0699/scm-0699.htm>.
- White & Case. 2025. "AI Watch: Global regulatory tracker — China." May 29. www.whitecase.com/insight-our-thinking/ai-watch-global-regulatory-tracker-china.

- Wiggers, Kyle. 2025. "DeepSeek: The countries and agencies that have banned the AI company's tech." TechCrunch, February 3. <https://techcrunch.com/2025/02/03/deepseek-the-countries-and-agencies-that-have-banned-the-ai-companys-tech/>.
- Working Group on Artificial Intelligence and Its Implications for the Information and Communication Space. 2024. *AI as a Public Good: Ensuring Democratic Control of AI in the Information Space*. February. Paris, France: Forum on Information & Democracy. <https://informationdemocracy.org/wp-content/uploads/2024/03/ID-AI-as-a-Public-Good-Feb-2024.pdf>.
- WTO Secretariat. 2024. *Trading with intelligence: How AI shapes and is shaped by international trade*. Geneva, Switzerland: WTO. www.wto.org/english/res_e/booksp_e/trading_with_intelligence_e.pdf.
- Yang, Zeyi. 2025. "How Chinese AI Startup DeepSeek Made a Model that Rivals OpenAI." *Wired*, January 25. www.wired.com/story/deepseek-china-model-ai/.
- Yglesias, Matthew. 2023. "I'm skeptical that powerful AI will solve major human problems. Unless it takes over the world — which I would prefer to avoid." *Slow Boring*, May 10. www.slowboring.com/p/im-skeptical-that-powerful-ai-will.



67 Erb Street West
Waterloo, ON, Canada N2L 6C2
www.cigionline.org