

Can trade agreements narrow the global data divide?

A novel agenda for digital trade

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Introduction

The data divide between the developing and developed world is multi-dimensional, extending to economic, social, and political aspects of everyday life. This divide leads to the exclusion of developing countries from digital supply chains and creates excessive dependence on leading digital powers.

The Covid-19 pandemic has starkly illustrated the divide between developing and developed countries in the ever more valuable realm of data. The data divide between the developing and developed world is multi-dimensional, extending to economic, social, and political aspects of everyday life. This divide implicates developing countries in various ways. Access to the internet is often weak, expensive, or unreliable in many developing countries.¹ Domestic capacity for data processing, including the ability of local companies to collect and curate data, is also often lacking or insufficient.² There are frequent breaches of digital users' rights;³ and the capacity of developing countries to maximise their data for economic or social benefits is far too limited.⁴

Inevitably, the global data divide leads to the exclusion of developing countries from digital supply chains and creates excessive dependence on leading digital powers. Developing countries also face deeper socio-economic and political risks. These risks include:

1. Stifling digital entrepreneurship;
2. Underdeveloped digital infrastructure;
3. Security risks arising from excessive reliance on data and digital network infrastructure based in foreign countries or operated by foreign companies;
4. Underwhelming regulatory capacity to enforce the digital rights of domestic users

It comes as no surprise that various regional and international organisations are exploring new mechanisms to address the data divide.

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Can this global data divide be bridged? International trade agreements, particularly electronic commerce/digital trade chapters and new generation agreements such as the Digital Economy Partnership Agreement (DEPA), can play a role in bridging this divide.⁶ Promoting data inclusion through inward-looking, protectionist measures are a growing trend in several parts of the world. However, a far more holistic and meaningful approach entails using digital trade agreements to build trust through international regulatory cooperation, reducing barriers to digital trade, and creating robust mechanisms for supporting developing countries to build their infrastructure for the data-driven economy.

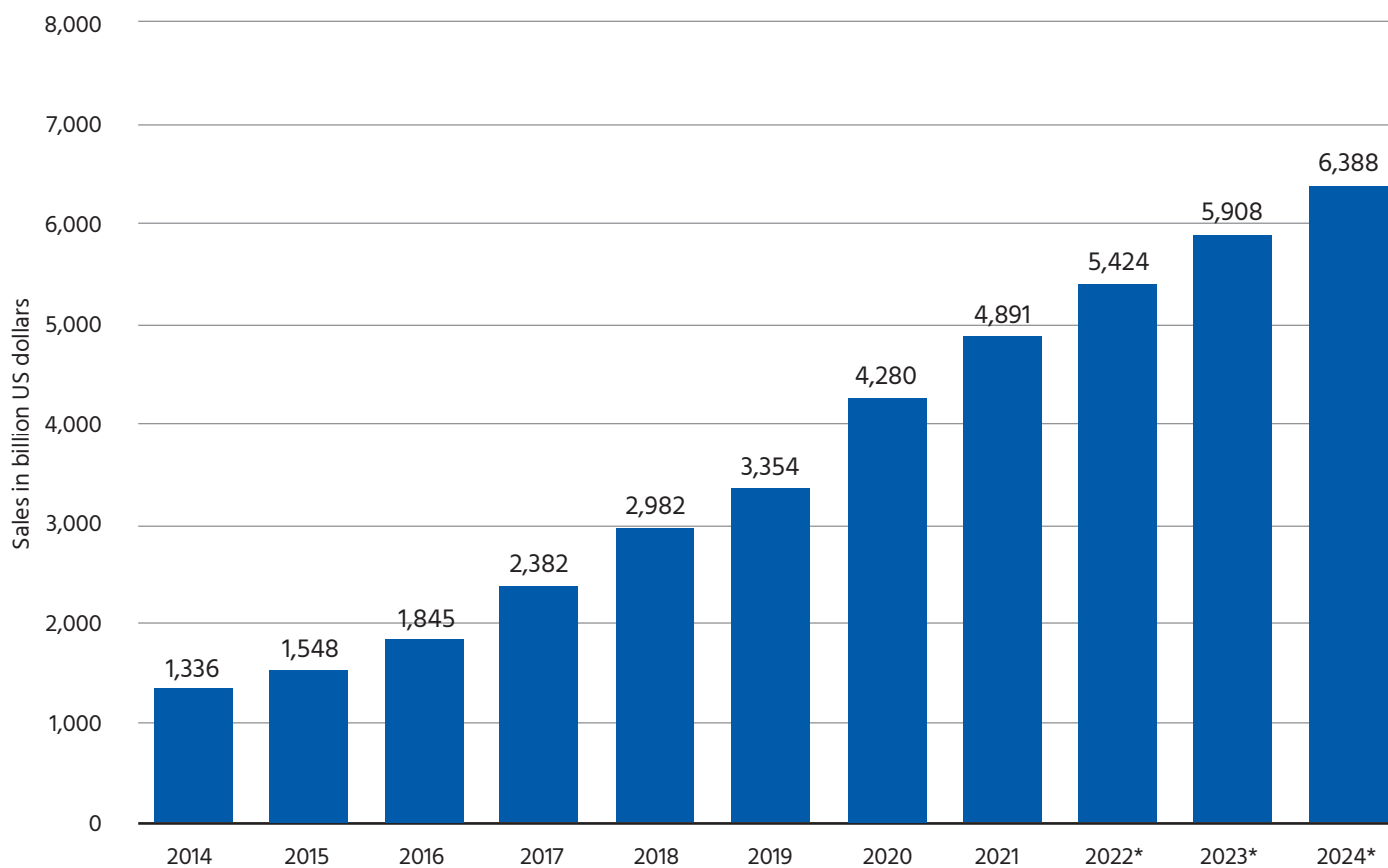
The economic implications of a global data divide

The global digital economy is showing no signs of slowing down and has received a new boost during the Covid-19 pandemic.

The world's ten largest technology firms earned a revenue of approximately US\$2 trillion in 2020. That constitutes 2.35% of the global GDP. Except for Samsung, all the companies are based in the US and China.

It is impossible to assess the exact size of the digital economy. However, given the intrinsic interlinkages of the digital and physical world, we can gauge its size by considering certain statistics. The world's ten largest technology firms, for instance, earned a revenue of approximately US\$2 trillion in 2020.⁷ That constitutes 2.35% of the global GDP. Except for Samsung, all the companies are based in the US and China. In 2020, with US\$4.3 trillion in sales, online retail boomed and represented around 18% of all consumer retail.⁸ China's e-commerce market – the largest in the world since 2013 – dominated with online sales amounting to US\$2.3 trillion.⁹ Compare that to the entire African continent, where online sales stood at US\$27.9 billion in 2020.¹⁰ These statistics represent the massive growth potential of the digital economy but also the increased entrenchment of the data divide.

Figure 1 – Retail e-commerce sales, 2014 to 2024 (in US\$ billion)



Source: Statista

* Forecast. Includes products or services ordered using the internet via any device, regardless of the method of payment or fulfillment

Some 66% of international web traffic is routed just through the US, and 70% of Africa's 4G infrastructure has been dependent on Huawei.

The economic repercussions of the data divide are evident in several other indicators. According to a study by Nikkei Asia, 23% of cross-border data flows were attributable to China and 12% to the US. In contrast, developing countries in Latin America and Africa account for a much smaller percentage of data flows.¹¹ Another study reported that 66% of international web traffic is routed just through the US.¹² Data centre mapping statistics indicate that data centres are concentrated in northern America, western Europe, China, and parts of the Asia-Pacific region.¹³

The same holds true for the infrastructure necessary to provide access to the internet. Some 70% of Africa's 4G infrastructure has been dependent on Huawei, a particularly significant concern given the escalating technology competition between China and the US.¹⁴

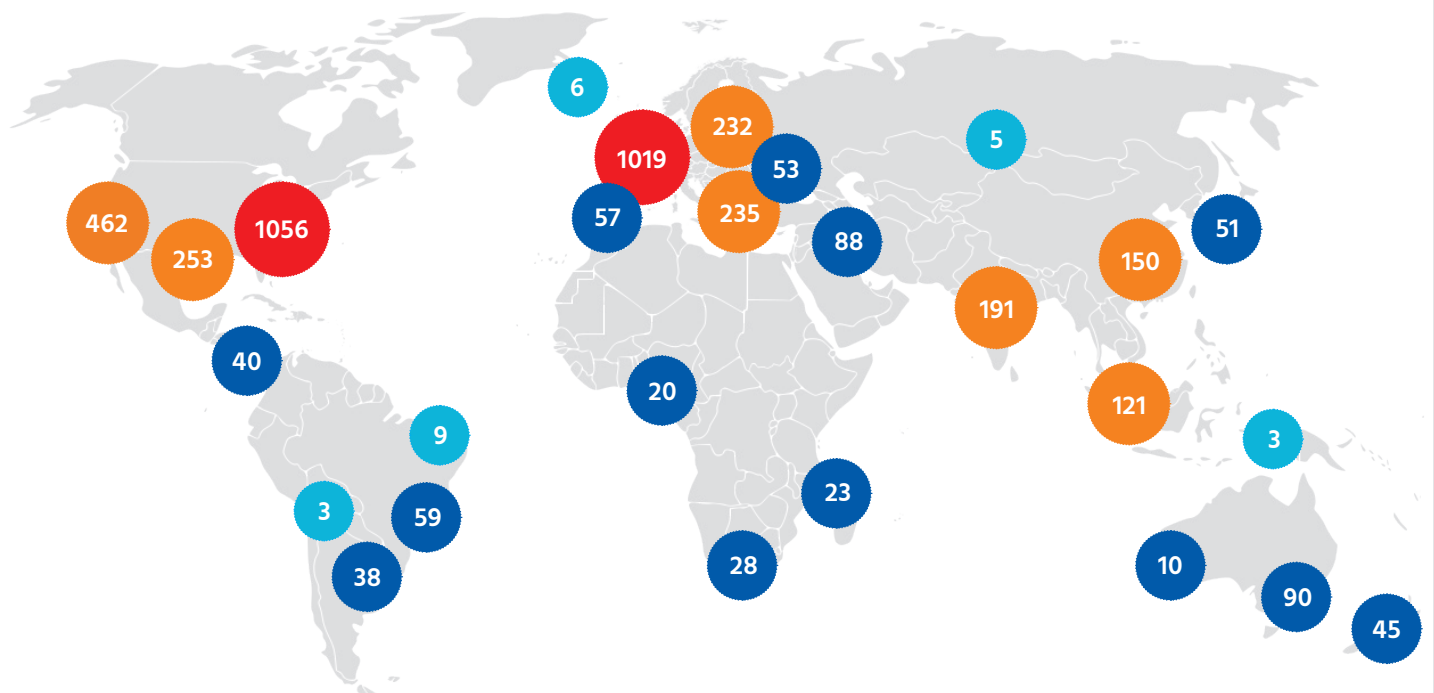
Complex frameworks

Most developing countries face a 'false choice' between building a domestic data governance framework that aligns with one of the dominant regulatory models or risking exclusion from the global digital supply chain.

The regulatory sphere also reflects the data divide, with China, the EU, and the US representing the 'predominant' data realms of the world.¹⁵ Consequently, most developing countries face a 'false choice' between building a domestic data governance framework that aligns with one of the dominant regulatory models or risking exclusion from the global digital supply chain.

Such a choice is particularly troubling as several developing countries may not have the regulatory capacity to adopt a complex framework. For instance, adoption of frameworks for cross-border transfer of personal data¹⁶ similar

Figure 2 – Concentration of data centers



Source: Data Center Map
Note: Not to scale

to that of the EU's General Data Protection Regulation (GDPR) would entail high compliance costs for regulators and could result in weak, ineffective, and sub-optimal privacy and cybersecurity regulations within a country.¹⁷ This is primarily due to the high implementation costs required to maintain well-funded regulators, and the lack of a supra-national rule-making body similar to the EU.¹⁸

Indeed, small businesses in developing countries struggle to comply with the complex frameworks for data transfers in global markets. Multiple studies indicate that the cost of implementing model contracts for data transfer under the GDPR is burdensome for most small companies.¹⁹ Experts have argued that the GDPR has dealt a death blow to Africa's e-commerce markets and their global plans.²⁰

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Furthermore, the idea of privacy differs across countries, and the trade-off between the costs of privacy and the benefits of cheaper access in its absence must be negotiated at the national level.²¹ In the absence of such a public discussion, imported implementation of GDPR-style rules may end up in failure. Additionally, focusing on following the GDPR diverts attention from the much bigger problem in most developing countries: government surveillance.

Several problems may also ensue from the implementation of extensive data localisation requirements akin to those of China. This can lead to poor implementation, increased costs from monitoring the implementation of data localisation laws, public opposition to reduced choices of competitively priced services, and the aforementioned surveillance by authorities.

Dependence on economic giants

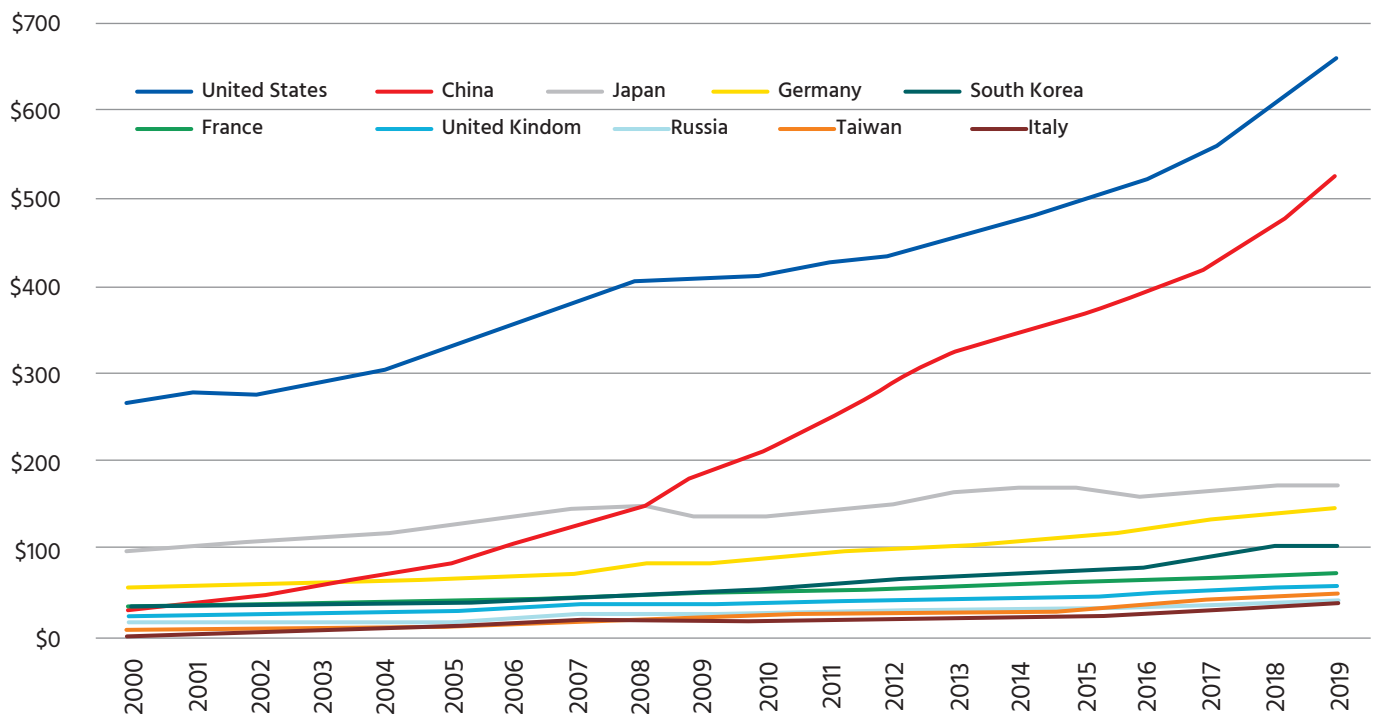
As the bulk of data-driven technologies originate from China and the US, most countries remain dependent on these economic giants to develop their domestic digital sector. This dependence has led to concerns regarding the equitable distribution of economic benefits and systemic market failures such as network externalities and information asymmetry in the developing world.²²

It is particularly difficult for smaller developing countries to break the positive feedback loop created by data-driven development. Countries at the forefront of data-driven analytics are primed to improve their technologies at a faster pace and subsequently gain global market share advantage.²³ This is reflected in several datasets. Take, for instance, global research & development (R&D) receipts, which reflect the world's tally for use of intellectual property. In 2020, the total amount received by all countries in patent royalties was US\$388 billion. Of this, the United States alone received US\$114 billion, constituting almost one third of the total global value.²⁴ This represents American strong-hold over the knowledge economy.

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We can also look at R&D expenditures as a percent of GDP. While most developing countries spend under 1% of their GDP on R&D, the R&D spending of developed countries like the US and Germany can exceed 3% of their GDP, reflecting a deepening of technological advancement.²⁵ In terms of value, only two developing countries (China and Turkey) were part of the top 20 countries spending the most on R&D.²⁶

Excessive dependence on external technologies can also pose a security risk. Many developing countries may have limited capacity to protect their critical digital infrastructure from security intrusions and illegal foreign surveillance.²⁷ For instance, in the survey for the Cybersecurity Exposure Index, 75% of African

Figure 2 – R&D expenditures of selected countries, 2000-2019 (in billions of current PPP dollars)

Source: CRS analysis of Organisation for Economic Cooperation and Development, OECD.Stat database, https://stats.oecd.org/Index.aspx?DataSetCode=MSTI_PUB.
Notes: PPP = Purchasing Power Parity. PPP is used to determine the relative value of different currencies and to adjust data from different countries to a common currency allowing direct comparisons among them.

countries were classified as having high and very-high cyber-risk exposure, and the continent has the highest score for exposure.²⁸ In contrast, most European and North American countries have a low to very-low risk profile in the index. Similar results can also be found in the Global Cybersecurity Index, formulated by the International Telecommunications Union.²⁹

Trust deficit

Thus, several developing countries anticipate both economic and political risks from the yawning digital divide, leading to a trust deficit in the global digital economy. This trust deficit subsequently prompts policy decisions that threaten the free flow of digital trade.

The push for data localisation across the developing world represents the most debated policies. India, for example, has been pushing for extensive data localisation.³⁰ Some reports show that almost 62 countries, most of them in the developing world, now impose some form of data localisation.³¹ This debate is increasingly becoming one of sovereignty and attracts political support in developing countries – with unprecedented consequences for the digital economy.³²

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or cyber-sovereignty with government control over what data flows in and out of the country.³³ For developing countries, the challenge lies in maximising the benefits of cross-border data flows while also preserving sufficient policy space to regulate sensitive aspects of the economy, including digital financial markets, consumer protection, data protection, and cyber-security. Due to the lack of regulatory capacity, digital education, and regulatory cooperation transnationally, however, this balance can be difficult to achieve.

The digital sovereignty emerging in many parts of the world has become a complex concoction of digital protectionism, self-reliance, strategic security policies, and protecting the socio-cultural fabric.

In turn, the digital sovereignty emerging in many parts of the world has become a complex concoction of digital protectionism, self-reliance, strategic security policies, and protecting the socio-cultural fabric of society.³⁴ The results are regulations that are inward-looking and isolationist, and policies that hinder the broad and sustainable growth of the digital economy.

International trade law: Taking stock and looking ahead

The asymmetry of digital development and the widening data divide has not gone unnoticed by the trade policy community. Since the early days of the Joint Statement Initiative on E-commerce (JSI) at the World Trade Organization (WTO), groupings of developing countries (such as the Friends of E-commerce for Development) have raised issues pertaining to digital trade facilitation.³⁵

Outside of the JSI, India and the African Group have been vocal regarding the adverse economic implications of renewing the moratorium on customs duties on electronic transmissions and the policy space necessary for developing countries to build their domestic data-driven sectors.³⁶

It is difficult to ascertain the real net loss to these countries caused by the moratorium. A study by UNCTAD argued that developing countries face a total loss of US\$8 billion. Another study from the European Centre for International Political Economy counters that developing countries can gain US\$10.6 billion by not imposing the moratorium.³⁷ The OECD has also argued that the customs revenue lost due to the e-commerce moratorium is negligible for developing countries, while the potential benefits could be to the tune of US\$940 million.³⁸ Nonetheless, the moratorium issue is a result of the emerging trust deficit between developed and developing countries. India's strong advocacy for ending the moratorium, for example, is inconsistent with the business reality: Exporting more than US\$149 billion of software services, India is a leading exporter of digital services.³⁹

It is both necessary and timely for trade negotiators to consider the role and relevance of trade rules in bridging the digital divide.

Certain new-generation trade agreements, especially the DEPA, have highlighted specific aspects of digital development. Studies indicate, however, that many new trade agreements with electronic commerce/digital trade chapters remain mostly silent on digital development issues. It is both necessary and timely for trade negotiators to consider the role and relevance of trade rules in bridging the digital divide.

Data flows at the heart of the data divide

Several mainstream narratives highlight the importance of free data flows to harness data for widespread economic development.

By mandating data localisation, countries would force digital firms to have servers in multiple jurisdictions, taking away benefits of scale and potentially requiring them to run servers within given countries even at significant cost.

Most data localisation policies, experts argue, are economically inefficient and create unnecessary barriers to trade, especially for small businesses.⁴⁰ It is an accepted economic theory that countries should do what they do best; data localisation runs contrary to this theory of comparative advantage. By mandating data localisation, countries would force digital firms to have servers in multiple jurisdictions, taking away benefits of scale and potentially requiring them to run servers within given countries even at significant cost. Small businesses slowly going online would face much higher costs for cloud services – the backbone of digital transformation.⁴¹

Currently, small businesses benefit from the location of cloud services in low-cost locations such as the British Virgin Islands, which hosts 741,079 servers per million people – the highest in the world – or Central America's Belize, which hosts over



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130,000 servers per million people.⁴² The lower cost offered by these countries are eventually passed to end-users, including small businesses and individual entrepreneurs.

Similarly, concerns are mounting about digital protectionist policies that strive to build domestic digital economies without commensurate resources, infrastructure, and regulatory capacity.⁴³ Expectedly, many recent digital trade chapters in trade agreements contain binding provisions prohibiting data localisation and facilitating the free flow of data with limited public policy exceptions.⁴⁴

Without creating an environment of digital trust and international regulatory cooperation, the narrative on the free flow of data is rightly perceived as one-sided and favouring the digitally developed countries.

Yet, recent years have seen several developing countries adopt domestic frameworks protecting local technology companies, including through extensive data localisation provisions.⁴⁵ This contradiction is not surprising. Without creating an environment of digital trust and international regulatory cooperation, the narrative on the free flow of data is rightly perceived as one-sided and favouring the digitally developed countries.⁴⁶

The G20 initiative on ‘data free flow with trust’ provides an important and solid foundation to build a secure and open environment for global data transfers. Yet trading partners must have a common understanding of what constitutes digital trust.⁴⁷ Specifically, in the context of including developing countries, bridging the data divide is a key component of digital trust.

Interoperability at the heart of regulatory frameworks

The first key element of bridging the data divide is the enabling of all trading partners to build basic regulatory frameworks addressing data protection, spam, cybersecurity protection, and online consumer protection. Some recent trade treaties include provisions requiring parties to adopt frameworks on data protection consistent with international standards, including specifying frameworks that can form the basis of consensus between trading partners, such as the APEC Cross-Border Privacy Rules (CBPR) mechanism in the United

States Mexico Canada Agreement.⁴⁸ In contrast, provisions on online consumer protection and cybersecurity protection are generally much narrower and weaker in international trade agreements.⁴⁹ According to a University of Lucerne dataset consisting of more than 190 free trade agreements (FTAs) with electronic commerce chapters/provisions, only 29 FTAs have some form of commitments on consumer protection, of which only three FTAs had provisions that are legally binding.⁵⁰

The existing rules on digital trade in FTAs are largely inadequate in addressing realities on the ground.

The existing rules on digital trade in FTAs are largely inadequate in addressing realities on the ground. The first weakness is the lack of consideration regarding the capacity of parties in the developing country to implement these regulatory frameworks.

Secondly, not all developing countries have similar regulatory requirements or preferences. For instance, several developing countries have limited legislative capacities and lack institutions which can proactively monitor the digital sector. Take the example of data privacy. Merely half of 54 African countries have some sort of enactment.⁵¹ Even larger developing countries, such as India, lack data protection frameworks and operate under decades-old information technology laws.⁵²

Furthermore, not all countries have the same preferences in regulating the digital sector. For instance, certain data protection and cybersecurity laws are aimed at increasing information security rather than protecting the privacy of individuals.⁵³ Larger developing countries are also likely to formulate laws that increase economic opportunities for their domestic digital sector, including through measures that increase government control over who can use the data collected from their citizens.⁵⁴

Finally, implementation of standardised frameworks can be particularly uncomfortable for developing countries that do not have the capacity or awareness to contribute to the development of standards on cybersecurity, privacy protection, and data transfers.

How trade agreements can help

One way trade agreements can address the data divide is by facilitating greater interoperability of regulatory frameworks, acknowledging that not all countries can adopt a harmonious privacy or cybersecurity framework. Provisions in the DEPA that focus on interoperability with respect to e-invoicing (art 2.5) and e-payments (art 2.7) provide some interesting ideas, and they significantly advance the interoperability requirements contained in the electronic commerce chapter of the Comprehensive and Progressive Trans-Pacific Partnership Agreement (CPTPP).⁵⁵

The DEPA also focuses on the importance of creating trust-marks and other tools of mutual recognition for enabling cross-border transfer of personal data (art 4.2).

For interoperability-related provisions to be meaningful, developing countries must be able to contribute to the development of international standards on data transfer and security.

However, for interoperability-related provisions to be meaningful, developing countries must be able to contribute to the development of international standards on data transfer and security. There are existing options to explore. For example, digital trade agreements could incorporate a clause similar to the WTO's Technical Barriers to Trade (TBT) Code of Good Practice, which sets out representativeness, objectivity, and transparency of standards as pre-requisites for recognition under WTO law.⁵⁶



One way trade agreements can address the data divide is by facilitating greater interoperability of regulatory frameworks. Provisions in the DEPA provide some interesting ideas.

International regulatory cooperation at the heart of reform

To build interoperable and transparent regulatory frameworks, all countries must be able to exchange information about their regulatory experiences and come to a common understanding on common standards, best practices, and mutual recognition mechanisms for different data certification standards and trust-marks.

Here, international regulatory cooperation can be particularly pertinent.⁵⁷ Countries that collaborate can develop and adopt more widely accepted and representative standards for data transfer/sharing and assist in addressing novel transnational policy challenges arising from new technologies, including problems of cross-border enforcement of domestic regulations.

Regulatory cooperation can enable more experimental initiatives for sandboxes without harming digital innovation or public interests and create more future-forward frameworks for digital inclusion.

Regulatory cooperation can also enable more experimental initiatives for sandboxes without harming digital innovation or public interests and create more future-forward frameworks for digital inclusion. Such initiatives can encompass work towards open government data and data sharing for development purposes, including data trusts. Data trusts are independent fiduciary organisations which receive data from providers (e.g., users, companies, government), manage it, and share it – keeping in mind the best interest of its data providers.⁵⁸ For example, Biobank UK is a data trust which holds the genetic and health data of over half a million people and shares the data with health and R&D organisations with the interests of data providers in mind.⁵⁹

International regulatory cooperation could be most effective if there is a robust mechanism outlined in the trade agreement to facilitate dialogue between all parties and get them on an equal footing. For instance, parties could agree to set up an institution with members from each partner country to deliberate on relevant issues on a regular basis. Such an assembly could work towards formulating high-level principles for data-driven trade that could then be used to update the digital trade agreements.

Furthermore, the institution could engage with other non-trade bodies dealing with different aspects of data governance and incorporate relevant international standards. While it remains largely uncommon, the complexities of multi-layered data governance regimes require trade institutions to engage with transnational and multistakeholder counterparts to understand the sector's evolving norms and best practices.⁶⁰

Technical assistance key to involving developing country voices

It is time for developing countries to meaningfully contribute to the global dialogue on data governance and digital development. In practice, several developing countries are unlikely to have sufficient resources or centralised capacity to make sustained contributions in relevant fora. Here, developed countries can play a key role. Through dedicated technical assistance and capacity building programs, they can enable more inclusive dialogue. Such support is vital to building a robust global digital economy.

It is also important that technical assistance programmes do not become a disguise for forced regulatory harmonisation, especially given the unique and sensitive nature of data regulation.

Developed countries can play a key role through dedicated technical assistance and capacity building support programs. The approach should be holistic and meaningful, requiring transparent discussion between the parties.

Most trade agreements contain minimal commitments on initiatives for technical assistance, including for digital trade/e-commerce chapters. While certain treaties such as the CPTPP provide developing country partners a longer time to implement the regulatory frameworks, this may not be sufficient to implement complex data regulations in an effective manner, especially for lower-income countries. Therefore, the approach towards technical assistance and capacity building should be holistic and meaningful, requiring transparent discussion between the parties regarding the areas where support, training and information exchange is necessary to facilitate equitable data-driven development.

Data sharing initiatives, include open licensing programmes and data trusts, could also be relevant to promoting data-driven innovation in developing countries.

While the DEPA makes some references in this regard, future digital trade agreements could be far more comprehensive in creating institutional mechanisms for dialogue on these issues. A provision on digital inclusion (inspired by Module 11 of the DEPA) could be helpful. This provision can identify areas where judicious intervention – such as aligning stakeholders with international and regional institutions working on digital inclusion – can help to bridge the data divide.

Conclusion:

Choosing the right path



Most, if not all, developing countries would overcome the data divide more effectively by integrating meaningfully into the global digital supply chain.

The data-driven economy is expanding rapidly, and most developing countries today are facing difficult choices. They can take an inward-looking approach by shielding themselves from global market forces, or they can opt for an outward-looking approach that requires building trust and sustainable structures of digital cooperation with their trading partners. In the long run, the latter approach is more sensible and sustainable, and international trade law can be the conduit for bridging the data divide.

Most, if not all, developing countries would overcome the data divide more effectively by integrating meaningfully into the global digital supply chain.

While the narrative of building an independent domestic digital economy sounds appealing, especially in the current geopolitical environment, the digital economy is heavily interconnected. Most, if not all, developing countries would overcome the data divide more effectively by integrating meaningfully into the global digital supply chain. If countries remain genuinely committed to using trade agreements for the benefit of digital trade, there is hope in closing the data divide.

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Neha Mishra is a lecturer at the Australian National University College of Law. She was previously postdoctoral fellow at the Centre for International Law, National University of Singapore. Neha has also held visiting research positions at the Max Planck Institute Luxembourg and the World Trade Organization.

Neha holds a doctorate degree in law from the University of Melbourne (Australia). Her thesis, investigating how international trade agreements apply to government restrictions on cross-border data flows, was awarded the 2019 Harold Luntz Graduate Research Prize for the best thesis in Melbourne Law School and the 2020 University of Melbourne Chancellor's Prize for Excellence in the PhD Thesis.

Neha completed her undergraduate degree in law from National Law School Bangalore (India), LLM in Public International Law from London School of Economics (UK), and Master's in Public Policy from National University of Singapore (Singapore). She is a dual-qualified lawyer (UK and India) and has previously practised law with Herbert Smith Freehills LLP in London and Economic Laws Practice in Delhi. She also served as a lecturer at National Law School of India University (Bangalore).



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Endnotes

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1. For instance, a study by the International Telecommunications Union found that only 15% of households in LDCs have access to the internet. <https://www.itu.int/en/ITU-D/LDCs/Pages/ICT-Facts-and-Figures-2017.aspx#:~:text=15%25%20of%20households%20in%20LDCs,a%20penetration%20rate%20of%2022%25>.
2. “Low- and middle-income countries lack access to big data analysis – here’s how to fill the gap”. By David Gunderman and Eric Vance. July 20, 2021. <https://theconversation.com/low-and-middle-income-countries-lack-access-to-big-data-analysis-heres-how-to-fill-the-gap-159412>.
3. “Developing countries that trust Facebook are most vulnerable to data breach. By Bhaskar Charkavorthi”. 28 March 2018. https://www.business-standard.com/article/international/developing-countries-that-trust-facebook-are-most-vulnerable-to-data-breach-118032800248_1.html Cybercrime: A Global Challenge, by United Nations Office for Drug and Crime. <https://www.itu.int/ITU-D/cyb/cybersecurity/docs/cybercrime.pdf>.
4. “Africa’s digital transformation risks becoming trapped in geopolitical competition”. By Faten Aggad, 8 Feb 2021. <https://mg.co.za/africa/2021-02-08-africas-digital-transformation-risks-becoming-trapped-in-geopolitical-competition/>.
5. The Digital Transformation Strategy for Africa (2020-2030), <https://au.int/en/documents/20200518/digital-transformation-strategy-africa-2020-2030>; World Development Report 2021: Data for Better Lives. <https://www.worldbank.org/en/publication/wdr2021>.
6. <https://www.mfat.govt.nz/assets/Trade-agreements/DEPA/DEPA-Signing-Text-11-June-2020-GMT-v3.pdf>
7. Statista Digital Economy Compass, 2021. <https://www.statista.com/study/105653/digital-economy-compass/>.
8. “Retail e-commerce sales worldwide from 2014 to 2024”. By Stephanie Chevalier for Statista. July 07, 2021. <https://www.statista.com/statistics/379046/worldwide-retail-e-commerce-sales/>.
9. “What is driving China’s e-commerce growth?”. October 13, 2021. <https://www.eastasiaforum.org/2021/10/13/what-is-driving-chinas-e-commerce-growth/>.
10. “E-commerce revenue in Africa in 2017 to 2025”. <https://www.statista.com/statistics/1190541/e-commerce-revenue-in-africa/#:~:text=During%202020%2C%20the%20revenue%20generated,increase%20between%202021%20and%202025>.
11. “China rises as world’s data superpower as internet fractures”. By Toru Tsunashima. <https://asia.nikkei.com/Spotlight/Century-of-Data/China-rises-as-world-s-data-superpower-as-internet-fractures>.
12. “Is It “Trade?” Data Flows and the Digital Economy”. By Milton Mueller and Karl Grindal. TPRC 46: The 46th Research Conference on Communication, Information and Internet Policy 2018. August 30, 2018. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3137819.
13. <https://www.datacentermap.com/>.
14. “Huawei’s deep roots put Africa beyond reach of US crackdown”. By Momoko Kidera. <https://asia.nikkei.com/Spotlight/Huawei-crackdown/Huawei-s-deep-roots-put-Africa-beyond-reach-of-US-crackdown>.
15. “Another Digital Divide: The Rise of Data Realms and its Implications for the WTO”. By Susan Ariel Aaronson, and Patrick Leblond. Journal of International Economic Law, Volume 21, Issue 2, June 2018, Pages 245–272. <https://academic.oup.com/jiel/article-abstract/21/2/245/4996295>.
16. Chander, Anupam; Abraham, Meaza; Chandy, Sandeep; Fang, Yuan; Park, Dayoung; Yu, Isabel. 2021. “Achieving Privacy: Costs of Compliance and Enforcement of Data Protection Regulation”. Policy Research Working Paper; No. 9594. World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/35306> License: CC BY 3.0 IGO.

17. UNCTAD Digital Economy Report 2021. https://unctad.org/system/files/official-document/der2021_en.pdf.
18. "Are Current Models of Data Protection Fit for Purpose? Understanding the Consequences for Economic Development". By Michael Pisa and Ugonma Nwankwo. Aug. 09, 2021. <https://www.cgdev.org/publication/are-current-models-data-protection-fit-purpose-understanding-consequences-economic>.
19. "The Role and Value of Standard Contractual Clauses in EU-US Digital Trade". By Nigel Cory, Ellyse Dick, and Daniel Castro. December 17, 2020. <https://itif.org/publications/2020/12/17/role-and-value-standard-contractual-clauses-eu-us-digital-trade>.
20. "Data Imperialism: The GDPR's Disastrous Impact on Africa's ECommerce Markets". By Sara Mannion. Vanderbilt Law Review, Vol. 58, Issue 2, 2020, pages 685-711. <https://scholarship.law.vanderbilt.edu/cgi/viewcontent.cgi?article=1019&context=vjtl>.
21. "Why the Rest of the World Can't Free Ride on Europe's GDPR Rules". By Bhaskar Chakravorti. April 30, 2018. <https://hbr.org/2018/04/why-the-rest-of-world-cant-free-ride-on-europes-gdpr-rules>.
22. UNCTAD Digital Economy Report 2021. https://unctad.org/system/files/official-document/der2021_en.pdf; Rethinking Industrial Policy for the Data-Driven Economy, by Dan Ciuriak. 17 Aug 2018. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3223072.
23. "Data, development, and growth". By Steven Weber. Cambridge University Press: 17 April 2017. <https://www.cambridge.org/core/journals/business-and-politics/article/abs/data-development-and-growth/DC04765FB73157C8AB76AB1742ECD38A>.
24. "Charges for the use of intellectual property, receipts". By World Bank. https://data.worldbank.org/indicator/BX.GSR.ROYL.CD?most_recent_value_desc=true&view=chart.
25. "Research and development expenditure (% of GDP)". By World Bank. https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS?most_recent_value_desc=true&view=chart.
26. Global Research and Development Expenditures: Fact Sheet. By Congressional Research Service. Sept/ 27, 2021. <https://sgp.fas.org/crs/misc/R44283.pdf>.
27. "Weaponized Interdependence: How Global Economic Networks Shape State Coercion". By Henry Farrell, Abraham L. Newman. International Security, Volume 44, Issue 1, Summer 2019. <https://direct.mit.edu/isec/article-abstract/44/1/42/12237/Weaponized-Interdependence-How-Global-Economic?redirectedFrom=fulltext>.
28. "Cybersecurity Exposure Index 2020 Reveals Most Vulnerable Countries". Cisomag. Jun3 18, 2020. <https://cisomag.eccouncil.org/cybersecurity-exposure-index-2020-reveals-most-vulnerable-countries/>.
29. ITU. Global Cybersecurity Index. <https://www.itu.int/en/ITU-D/Cybersecurity/Pages/global-cybersecurity-index.aspx>.
30. "How Would Data Localization Benefit India?". By Anirudh Burman and Upasana Sharma. April 2021. https://carnegieendowment.org/files/202104-Burman_Sharma_DataLocalization_final.pdf.
31. "How Barriers to Cross-Border Data Flows Are Spreading Globally, What They Cost, and How to Address Them". By Nigel Cory and Luke Dascoli. July 19, 2021. <https://itif.org/publications/2021/07/19/how-barriers-cross-border-data-flows-are-spreading-globally-what-they-cost>.
32. "Increasing Localisation of Data in Asia: Why this Matters for Tech". By Peggy Chow, Christine Sim and Clare Hubert. Dec. 09, 2021. <https://www.herbertysmithfreehills.com/latest-thinking/increasing-localisation-of-data-in-asia-why-this-matters-for-tech>.
33. <https://ustr.gov/sites/default/files/Digital-2-Dozen-Final.pdf>; China's "Vision for Cyber Sovereignty and the Global Governance of Cyberspace". By Adam Segal. NBR Special Report no. 87, August 25, 2020. <https://www.nbr.org/publication/chinas-vision-for-cyber-sovereignty-and-the-global-governance-of-cyberspace/>.
34. "Digital sovereignty". By Julia Pohle and Thorsten Thiel. Internet policy review, 17 Dec 2020. <https://policyreview.info/concepts/digital-sovereignty>.
35. https://www.wto.org/english/news_e/archive_e/jsec_arc_e.htm; https://unctad.org/system/files/non-official-document/eweek2018c01FED_en.pdf.
36. "India, South Africa question WTO e-commerce moratorium ahead of MC12". November 9, 2021. <https://insidetrade.com/daily-news/india-south-africa-question-wto-e-commerce-moratorium-ahead-mc12>; Work Programme on Electronic Commerce, Report of Panel Discussion on 'Digital Industrial Policy and Development'. https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S009-DP.aspx?language=E&CatalogueIdList=239772,239609,23946.

- 4,239336,239278,237818,237609,237614,237305,237306&CurrentCatalogueIdIndex=5&FullTextHash=&HasEnglishRecord=True&HasFrenchRecord=True&HasSpanishReco.
37. "Growing Trade in Electronic Transmissions: Implications for the South". By Rashmi Banga. UNCTAD Research Paper No. 29, 2019. https://unctad.org/system/files/official-document/ser-rp-2019d1_en.pdf; The Economic Losses from Ending the WTO Moratorium on Electronic Transmissions. By Hosuk-Lee Makiyama and Badri Narayanan. https://ecipe.org/wp-content/uploads/2019/08/ECI_19_PolicyBrief_3_2019_LY04.pdf.
 38. "Electronic transmissions and international trade - shedding new light on the moratorium debate". By Andrea Andrenelli and Javier López González (OECD). November 2019. <http://dx.doi.org/10.1787/57b50a4b-en>.
 39. India's Joint Submission with South Africa on 'E-Commerce Moratorium'. 10 March 2020. <https://commerce.gov.in/international-trade/india-and-world-trade-organization-wto/e-commerce/indias-joint-submission-with-south-africa-on-e-commerce-moratorium/>; India exports likely to fly high in New Year on global demand recovery. Dec. 19, 2021. https://www.business-standard.com/article/economy-policy/with-pli-schemes-global-demand-recovery-india-exports-likely-to-fly-high-in-new-year-121121900219_1.html.
 40. "The 'wicked problem' of data localisation". By Konstantinos Komaitis. Journal of Cyber Policy Volume 2, 2017 - Issue 3. Pages 355-365. <https://www.tandfonline.com/doi/abs/10.1080/23738871.2017.1402942>.
 41. A report from an technology industry body, Information Technology Industry Council, finds that the costs of cloud services would rise by 30-60% due to localisation policies. See The Costs of Data Localization. By Cody Ankeny (ITI). Aug. 17, 2016. <https://www.itic.org/news-events/techwonk-blog/the-costs-of-data-localization>.
 42. Secure Internet servers (per 1 million people). By World Bank. https://data.worldbank.org/indicator/IT.NET.SECR.P6?most_recent_value_desc=true&view=chart.
 43. UNCTAD Digital Economy Report 2021. https://unctad.org/system/files/official-document/der2021_en.pdf.
 44. "Digital Trade Provisions in Preferential Trade Agreements: Introducing a New Dataset". By Mira Burri, Rodrigo Polanco. Journal of International Economic Law, Volume 23, Issue 1, March 2020, Pages 187-220. <https://academic.oup.com/jiel/article-abstract/23/1/187/5718042>.
 45. "The Costs of Data Protectionism". By Martina F. Ferracane. Part I – Global Trade Law and Policy in the Age of Big Data. Cambridge University Press: 09 July 2021. <https://www.cambridge.org/core/books/big-data-and-global-trade-law/costs-of-data-protectionism/A97AC3D1E4EAD2A8B90F33EEF605D672>.
 46. "WTO Law and Cross-Border Data Flows an Unfinished Agenda". By Andrew D. Mitchell and Neha Mishra. Part I - Global Trade Law and Policy in the Age of Big Data. Cambridge University Press: 09 July 2021. <https://www.cambridge.org/core/books/big-data-and-global-trade-law/wto-law-and-crossborder-data-flows/FC0CF4A171B57CB6BF4F7CE96C5F1D45>; Cross-border Data Flows and Privacy. By Burcu Kilic and Renata Avila. <https://www.citizen.org/article/crossborder-data-flows-privacy/>.
 47. G20 Osaka Summit (Summary of outcome). https://www.mofa.go.jp/policy/economy/g20_summit/osaka19/en/overview/.
 48. "Digital Trade Provisions in Preferential Trade Agreements: Introducing a New Dataset". By Mira Burri, Rodrigo Polanco. Journal of International Economic Law, Volume 23, Issue 1, March 2020, Pages 187-220. <https://academic.oup.com/jiel/article-abstract/23/1/187/5718042>; United States-Mexico-Canada Agreement. <https://ustr.gov/trade-agreements/free-trade-agreements/united-states-mexico-canada-agreement>.
 49. "WTO Law and Cross-Border Data Flows an Unfinished Agenda". By Andrew D. Mitchell and Neha Mishra. Part I - Global Trade Law and Policy in the Age of Big Data. Cambridge University Press: 09 July 2021, <https://www.cambridge.org/core/books/big-data-and-global-trade-law/wto-law-and-crossborder-data-flows/FC0CF4A171B57CB6BF4F7CE96C5F1D45>.
 50. TAPED: A New Dataset on Data-related Trade Provisions. <https://www.unilu.ch/en/faculties/faculty-of-law/professorships/managing-director-internationalisation/research/taped/>.
 51. "Slowly but surely, data protection regulations expand throughout Africa". By Cathy-Eitel Nzume. April 02, 2021. <https://iapp.org/news/a/slowly-but-surely-data-protection-regulations-expand-throughout-africa/#:~:text=Despite%20these%20developments%2C%20only%20half,have%20enacted%20data%20protection%20laws>.

52. "Without the privacy and data protection law, India's regulation of Big Tech will be ad hoc". By Samir Saran, June 28, 2021. <https://theprint.in/opinion/without-the-privacy-and-data-protection-law-indias-regulation-of-big-tech-will-be-ad-hoc/685283/>.
53. "Hacking into China's Cybersecurity Law". By Jyh-An Lee. Wake Forest Law Review, Volume 53, Issue 1, 2018. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=317462.
54. "India Must Avoid Nationalisation of Data". By Nikhil Pahwa. 25 July 2020. <https://www.medianama.com/2020/07/223-non-personal-data-nationalisation/>.
55. <https://www.mfat.govt.nz/assets/Trade-agreements/TPP/Text-ENGLISH/14.-Electronic-Commerce-Chapter.pdf>.
56. Technical Information on Technical barriers to trade. World Trade Organization. https://www.wto.org/english/tratop_e/tbt_e/tbt_info_e.htm#:~:text=The%20Code%20of%20Good%20Practice,governmental%20and%20regional%20standardizing%20bodies.
57. Rethinking rulemaking through international regulatory co-operation. OECD Regulatory Policy Outlook 2021. https://www.oecd-ilibrary.org/sites/38b0fdb1-en/1/3/4/index.html?itemId=/content/publication/38b0fdb1-en&_csp_=98126082d8cd9c3becbc075f085ad466&itemIGO=oe&itemContentType=book#abstract-d1e14087.
58. "Data Trusts" Could Be the Key to Better AI". By George Zarkadakis. Nov. 10, 2020. <https://hbr.org/2020/11/data-trusts-could-be-the-key-to-better-ai>.
59. <https://www.ukbiobank.ac.uk/>.
60. "The Regime Complex for Managing Global Cyber Activities". Global Commission on Internet Governance Paper Series No. 1. By Joseph S. Nye Jr., May 20, 2014. <https://www.cigionline.org/publications/regime-complex-managing-global-cyber-activities/>.

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