GLOBAL DATA ALLIANCE
TRUST ACROSS BORDERS

CROSS-BORDER DATA TRANSFERS & INNOVATION

In today's rapidly changing world, the future depends on technological and scientific progress: Governments and industries must continually innovate to address emergent health, development, and sustainability challenges. Countries can foster innovation with the right mix of policy tools.[1] Those tools include cross-border access to technology; the ability to share knowledge, ideas, and information across international IT networks; and improved digital connectivity and inclusiveness. Applying these tools can also help ensure that innovations are widely disseminated–spreading their societal benefits for all, including safer and more rewarding work, improved health, and a cleaner environment.

Today's challenges call for creative and inventive endeavors on a collaborative, coordinated, and cross-border scale.

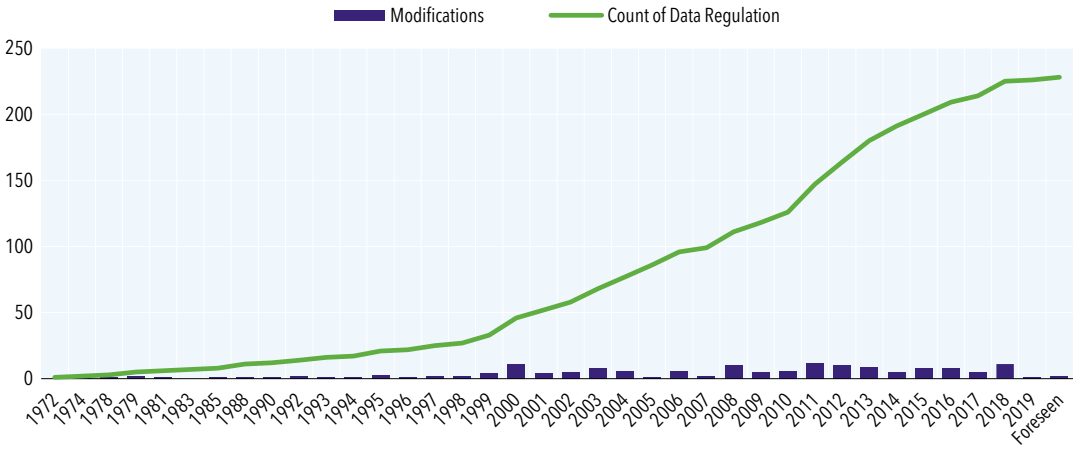
CROSS-BORDER DATA TRANSFERS ARE IMPORTANT TO INNOVATION

Technological and scientific endeavors are inherently cross-border in a connected global economy. For example, multinational teams of biopharmaceutical researchers engage in cross-border collaboration in many ways, including by leveraging artificial intelligence (AI) to identify potential drug candidates within large drug discovery data sets consolidated from around the world.[2] Similarly, cross-border access to remote work and remote learning technologies is necessary for workers, engineers, technicians, and students to collaborate across vast distances in an era of social distancing.[3] Scientific progress and technological competitiveness require the exchange of information and ideas across borders. Rising digital trade restrictiveness threatens this exchange.

> **"[F]or data to flourish as an input to innovation, it benefits from flowing as freely as possible, given necessary privacy protection policies. This may, at least in part, explain why binding rules on cross-border data transfers and localization restrictions have been introduced in a number of RTAs and have been discussed [at the WTO]."**
>
> WTO, *Government Policies to Promote Innovation in the Digital Age*, 2020 World Trade Report (2020)

Data policy measures, which may seek to achieve a range of policy objectives, are growing rapidly, increasing by at least 800% between 1995 and 2015.[4] How can governments ensure that such data-related policy measures facilitate–rather than impede–innovation? A growing consensus of authorities looks to whether measures are (1) transparent; (2) interoperable; (3) non-discriminatory; and (4) no more trade restrictive than necessary.[5] Human creativity and ingenuity depend heavily on access to, and exchange of, information, ideas, and knowledge. **For this reason, unnecessary or discriminatory data localization mandates and cross-border data transfer restrictions–which impede that access and exchange–are particularly detrimental to innovation.**

Figure 1. OECD Statistics on Data Regulation Growth, 1972–2019
Cumulative number of data regulations



Source: OECD, *Trade and Cross-Border Data Flows* (2019), https://doi.org/10.1787/b2023a47-en

Data policy measures tend to deter investment in R&D and innovation when they are opaque, discriminatory, more restrictive than necessary, or incompatible with other legal regimes.

CROSS-BORDER DATA TRANSFERS ARE IMPORTANT AT EVERY STAGE OF THE INNOVATION LIFE CYCLE

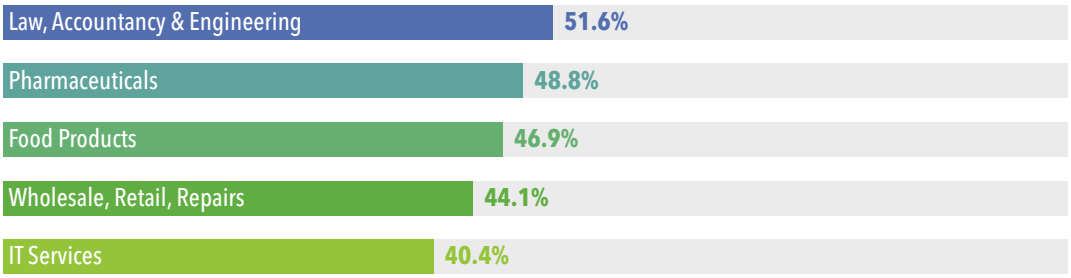
Cross-border data transfers support many aspects of innovation.

Data Transfers and Core Innovative Processes

In every sector, cross-border data transfers play an integral role in R&D, and other core innovative and creative functions. For example, in both semiconductor design and biopharmaceutical research, R&D depends on access to research data from laboratories and research institutions from sources across the world, as well as collaboration, joint research, and the exchange of ideas and knowledge among teams of inventors, designers, authors, and other creators and innovators in different countries. All these activities also rely on cloud computing and data storage to facilitate cost-effective analysis and storage of R&D data.[6]

This trend is also reflected in the growing percentage of scientific and research publications with co-authors from multiple countries. Figure 2 identifies the top five categories for such.

Figure 2. Top Five Sectors of Scientific Publications With International Co-authorship



Source: H. Dernis, P. Gkotsis, N. Grassano, S. Nakazato, M. Squicciarini, B. van Beuzekom, A. Vezzani, *World Corporate Top R&D Investors: Shaping the Future of Technologies and of AI*, A joint JRC and OECD Report (2019), http://www.oecd.org/sti/world-corporate-top-rd-investors-shaping-future-of-technology-and-of-ai.pdf.

Data Transfers and Artificial Intelligence

Businesses of all sizes in every sector of the economy can benefit from smart and responsible AI. Increasingly, R&D is conducted across cloud-enabled and networked environments that apply AI-based analytical software tools to research, statistical, and other data transferred around the world.[7] As explained by international science- and innovation-oriented organizations[8] and by national authorities,[9] such R&D depends on applying AI-related tools to globally sourced data sets. Data sets consolidated across IT networks and borders can be analyzed (e.g., through machine learning or data analytical techniques) to identify meaningful insights, patterns, and connections that can aid R&D teams in discovering and developing novel solutions to scientific and technical challenges.

Data Transfers and Regulatory Approval and Licensing Processes

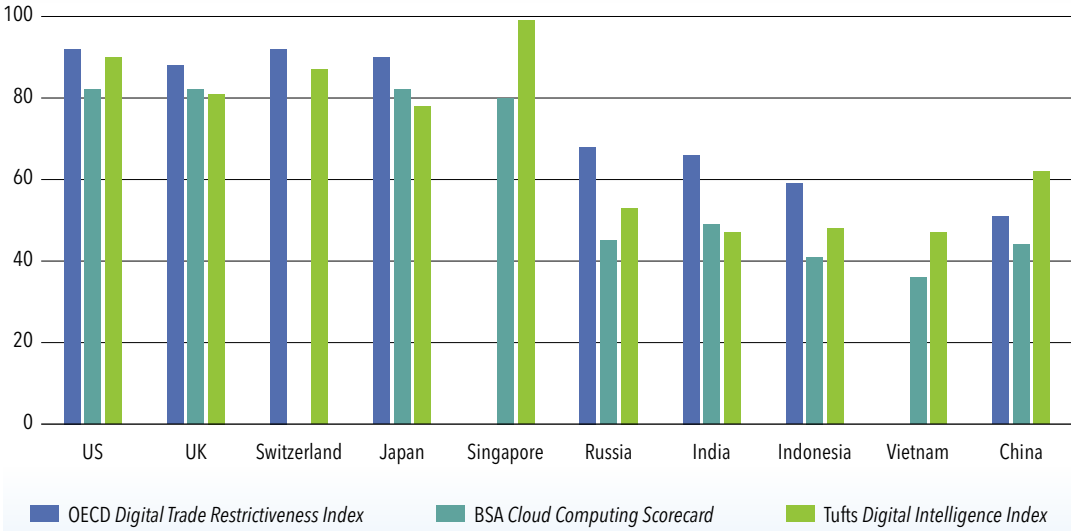
Transferring data across borders is also critical to advancing governmental approvals and licensures for innovative connected devices–from aircraft and vehicles, to medical devices and machine tools. Data transfers are not merely important to the functioning of these connected devices, but also to their regulatory testing and approval.

For example, doctors rely on life-enhancing connected medical devices that diagnose or treat endocrine, cardiovascular, oncological, or neurological conditions, which in turn depend on device producers' ability to share comprehensive safety and operational data with regulators such as the US Food & Drug Administration (FDA), the European Medicines Agency (EMA), and other members of the International Medical Device Regulators Forum (IMDRF). Restrictions on cross-border data transfers hinder the ability to share innovative device prototypes, scientific evidence necessary for premarket approval, and post-market surveillance data.

Data Transfers and Intellectual Property Application Processes

Innovators must transfer information across borders to apply for intellectual property (IP) rights with authorities in different countries. Access to data from multiple countries–such as prior art references–is an integral part of the patent application examination process. Likewise, transferring data (including inventor files, etc.) across borders is critical to advancing local innovation in developing countries through the international Inventor Assistance Program (IAP), which provides under-resourced developing country inventors with *gratis* legal representation from around the world.[10]

Measures of Digital Trade Openness, Cloud Readiness, and Digital Evolution[11]



Data localization mandates and data transfer restrictions are particularly detrimental to innovation because they impede information access and exchange. Trade barriers that impede data transfers undermine basic research and scientific activity, as well as the development of new treatments and inventions to protect human health and welfare.

Data Transfers and Market Access for Innovative Products

Cross-border data transfers are also necessary for servicing and supporting many exported products. Data localization mandates and data transfer restrictions can directly impede the ability to provide service or support, impairing foreign market access. With so many innovative exported products functionally depending on satellite or other cross-border data communications (e.g., IoT software applications in the aerospace, automotive, and agricultural machinery sectors; legitimate music and video streaming services; scientific publication databases), cross-border data transfer restrictions make it much more difficult for innovators and creators to sell or provide support to their products abroad.

Data Transfers and the Dissemination of the Benefits of Innovation

Cross-border data transfers are necessary to bring the benefits of innovations to populations at large. For example, in a recent WTO report describing data-related tools to facilitate an innovation-centric response to COVID-19, almost all (if not all) the tools described depended on the ability to transfer data across borders.[12]

In concrete terms, a country that unnecessarily limits cross-border data transfers limits its own workers' and citizens' access to technologies and data sources that are critical to development, innovation, and the transfer of technology. These include (1) software and ICT solutions that offer local Micro, Small, and Medium-Sized Enterprises (MSMEs) access to foreign buyers and financing; (2) scientific, research, and other publications that allow local inventors, designers, researchers to access knowledge from abroad; and (3) manufacturing data, blueprints, and other operational information necessary to support local construction, manufacturing, and service-related jobs.

> **"Technological advancement goes hand in hand with increased global data flows. Data are more valuable (and 'big data' especially so), thus increasing incentives to share them, including across borders."**
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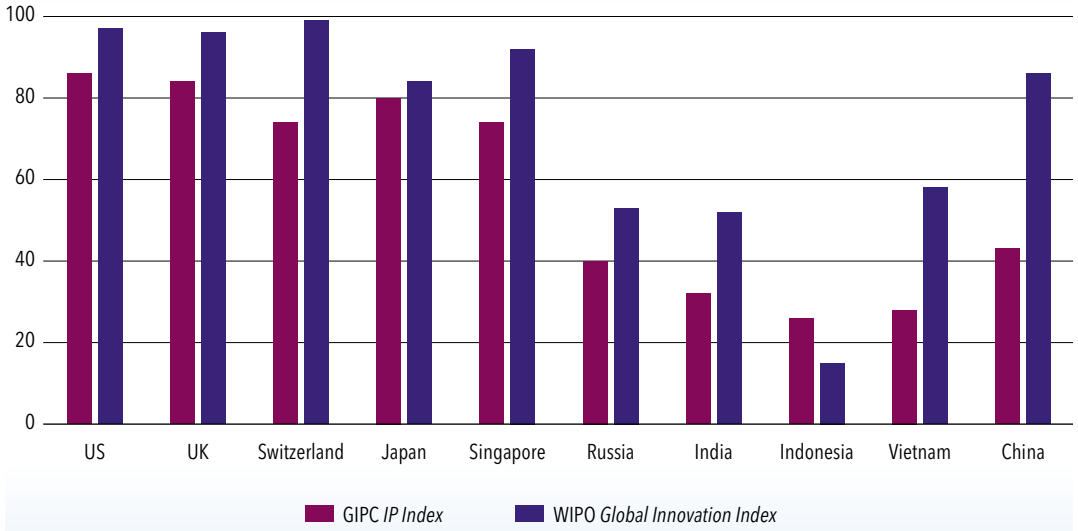
> OECD, *Digital Economy Outlook* (2020)

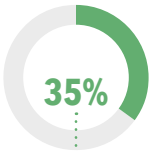
Innovation- and data-restrictive trade barriers undermine the core TRIPS Agreement objective of promoting, "technological innovation and…the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations."

Measures of Innovation-Related Performance[13]



DATA SNAPSHOT ON CROSS-BORDER INNOVATION

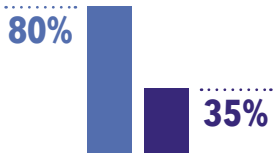
Research Collaboration Across Borders and Nationalities[14]



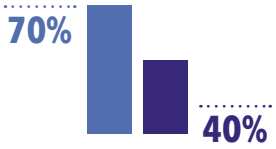
of scientific publications have multiple country co-authors

of certain AI-related publications (e.g., in the electrical and chemical arts) are more likely to have multiple country co-authors than single country authors

Inter- and Intra-Company Innovation, Including Across Borders[15]



80% of respondents from digitally advanced companies say their **organizations foster innovation through partnerships** with other organizations, as compared with **35%** of respondents at less digitally advanced companies



70% of respondents from digitally advanced companies say that **cross-functional teams are supported and given freedom to innovate**, as compared with less than **40%** of respondents at less digitally advanced companies

CONCLUSION

Data localization mandates and cross-border data transfer restrictions threaten the very innovation that is necessary to solve emergent health, climate, and economic challenges across the globe. Countries should refrain from imposing such restrictions, and should ensure any rules impacting cross-border data transfers (1) adhere to good regulatory practices, including transparency, (2) are non-discriminatory, (3) are necessary to achieve a legitimate objective and do not impose greater restrictions than necessary, (4) respect accountability models aligned with international best practices, and (5) are interoperable with other countries' legal frameworks.

Endnotes

1 *See e.g.*, Arthur D. Little, *The National Innovation Ecosystem: A Holistic Approach to Designing an Effective National Innovation Ecosystem* (2020), https://www.adlittle.com/sites/default/files/viewpoints/adl_national_innovation_0.pdf.

2 *See e.g.*, Ganes Kesari, "Why Covid Will Make AI Go Mainstream in 2021," *Forbes* (December 2020), https://www.forbes.com/sites/ganeskesari/2020/12/21/why-covid-will-make-ai-go-mainstream-in-2021-top-3-trends-for-enterprises/?sh=1d83a3f6797a; Arshadi et al., "Artificial Intelligence for COVID-19 Drug Discovery and Vaccine Development," *Frontiers in Artificial Intelligence* (August 2020), https://www.frontiersin.org/articles/10.3389/frai.2020.00065/full; Ungaro, et al., "Accelerating Vaccine Research for COVID-19 with High-Performance Computing and Artificial Intelligence," *HP Enterprise* (2020), https://www.hpe.com/us/en/newsroom/blog-post/2020/04/accelerating-vaccine-research-for-covid-19-with-high-performance-computing-and-artificial-intelligence.html; IEEE, "Can AI and Automation Deliver a COVID-19 Antiviral While It Still Matters?" *IEEE Spectrum* (2020), https://spectrum.ieee.org/artificial-intelligence/medical-ai/can-ai-and-automation-deliver-a-covid19-antiviral-while-it-still-matters.

3 *See* Global Data Alliance, *Cross-Border Data Transfers and Remote Work* (October 2020), https://globaldataalliance.org/downloads/10052020cbdtremotework.pdf; *See* Global Data Alliance, *Cross-Border Data Transfers and Remote Health Services* (September 2020), https://globaldataalliance.org/downloads/09152020cbdtremotehealth.pdf.

4 Martina Ferracane, *Restrictions on Cross-Border Data flows: A Taxonomy*, ECIPE Working Paper (2017), https://ecipe.org/wp-content/uploads/2017/11/Restrictions-on-cross-border-data-flows-a-taxonomy-final1.pdf. *See* OECD, *Trade and Cross-Border Data Flows* (2019), https://doi.org/10.1787/b2023a47-en.

5 *See e.g.*, OECD, *Principles for Market Openness in the Digital Age*, Working Party Report, TAD/TC/WP(2018)17/FINAL (2018) ("[A]pproaches to digital trade [should] be: *Transparent*: helping reduce the costs of operating across different markets and clarifying the rules that apply to different products by providing up-to-date information and enabling access for different stakeholders to the policy-making process. *Non-discriminatory*: ensuring that domestic incumbents are not favoured over foreign firms, or certain foreign firms over others, when operating in the digital space and selling like products in view of levelling the playing field. *Not unnecessarily trade restrictive to meet desired policy-objectives*: ensuring that the least trade restrictive tool is being used to meet desired objectives. This might involve drawing on the expertise of different policy communities and business. For instance, where digital trade might raise technical problems which might best be tackled through technical solutions. *Interoperable*: helping devices better speak to each other through more private sector discussion on technical specifications and allowing flexibility so that rules or standards are also based on common understandings, or at least offer possibilities of not mutually exclusive coexistence. Interoperability need not be forced, it might come naturally as a result of the processes that the above stated principles support.") http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=TAD/TC/WP(2018)17/FINAL&docLanguage=En.

Multi-Industry Statement on Cross-Border Data Transfers and Data Localization Disciplines in the WTO Negotiations on E-Commerce (January 26, 2021) (stating that, "Any [JSI] agreement should discipline unnecessary or discriminatory data localization mandates and data transfer restrictions. Any agreement should also be guided by principles of transparency and interoperability among legal frameworks; should apply across all economic sectors; and should require all countries to adopt or maintain legal frameworks to protect personal information.") https://iccwbo.org/content/uploads/sites/3/2021/01/multi-industry-statement-on-crossborder-data-transfers-and-data-localization.pdf.

Global Data Alliance, *Cross-Border Data Policy Principles* (2021) (outlining six policy principles, including that any rules impacting cross-border data transfers should be (1) developed and maintained in accordance with good regulatory practices; (2) non-discriminatory; (3) necessary to achieve a legitimate objective and not impose greater restrictions than necessary; and (4) interoperable), at _____ [au: complete cite?]

6 *See generally* Arthur D. Little, *Innovation Management* (2021) (identifying a range of innovation-enhancing digital tools and processes), https://www.adlittle.com/en/RightInnovationTools.

OECD Science, Technology and Industry Scoreboard 2017: The Digital Transformation (Paris: OECD Publishing, 2017), https://doi.org/10.1787/9789264268821-en. (Collaborations may take a variety of forms including international co-inventions involving several firms, both small and large, joint research ventures by private and public entities (e.g. firms and universities or public research organisations), and formal and informal networks of scientists. In the case of multinational corporations, international collaboration often reflects a process whereby companies rely on research and innovation facilities located in several economies to draw upon geographically dispersed knowledge and/or develop complementarities with foreign inventors.)

7 *See* Joshua Meltzer, *The Impact of Artificial Intelligence on International Trade* (Washington, DC: Brookings Institution, 2018), https://www.brookings.edu/research/the-impact-of-artificial-intelligence-on-international-trade/.

[8] *See e.g.*, WIPO, *WIPO Technology Trends 2019, Artificial Intelligence* (2019), https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1055.pdf; WIPO, *Frequently Asked Questions: AI and IP Policy* (2021), https://www.wipo.int/about-ip/en/artificial_intelligence/faq.html; WIPO, *Artificial Intelligence and Intellectual Property Policy* (2020), https://www.wipo.int/about-ip/en/artificial_intelligence/policy.html.

[9] *See e.g.*, Canadian Intellectual Property Office, *Processing Artificial Intelligence: Highlighting the Canadian Patent Landscape* (2020), https://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/vwapj/AI_Report_ENG.pdf/$FILE/AI_Report_ENG.pdf; Japan Patent Office, *Recent Trends in AI-Related Inventions* (2019), https://www.jpo.go.jp/e/system/patent/gaiyo/ai/document/ai_shutsugan_chosa/report-2019.pdf; IP Australia, *Machine Learning Innovation: A Patent Analytics Report* (2019), https://www.ipaustralia.gov.au/sites/default/files/reports_publications/patent_analytics_report_on_machine_learning_innovation.pdf; UKIPO, Artificial Intelligence: A Worldwide Overview of AI Patents and Patenting by the UK AI Sector (2019), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/817610/Artificial_Intelligence_-_A_worldwide_overview_of_AI_patents.pdf; European Patent Office, *Patents and the Fourth Industrial Revolution* (2017), documents.epo.org/projects/babylon/eponet.nsf/0/17FDB5538E87B4B9C12581EF0045762F/%24File/fourth_industrial_revolution_2017__en.pdf; USPTO, *Artificial Intelligence Webpage* (2021), https://www.uspto.gov/initiatives/artificial-intelligence; USPTO, *Public Views on Artificial Intelligence and Intellectual Property Policy* (2020), https://www.uspto.gov/sites/default/files/documents/USPTO_AI-Report_2020-10-07.pdf; USPTO, *Inventing AI: Tracing the Diffusion of Artificial Intelligence with US Patents* (October 2020), https://www.uspto.gov/sites/default/files/documents/OCE-DH-AI.pdf.

[10] WIPO, *Inventor Assistance Program Webpage* (2021) ("The Inventor Assistance Program—a WIPO initiative in cooperation with the World Economic Forum—is the first global program to match developing country inventors and small businesses with limited financial means with…experts [who] provide *pro bono* legal assistance to help inventors secure patent protection."), https://www.wipo.int/iap/en/; David Kappos, *3 Ways to Improve the Patent System and Protect Inventors*, World Economic Forum (2019), https://www.weforum.org/agenda/2019/06/ways-to-improve-the-patent-system-and-protect-inventors/.

[11] This chart comprises data from the 2019 OECD *Digital Trade Restrictiveness Index*, the 2018 BSA *Cloud Computing Scorecard*, and the 2020 Tufts University *Digital Intelligence Index* (specifically, its scoring of the state of "digital evolution" in the listed countries).

- The 2018 BSA *Cloud Computing Scorecard* highlights data localization measures and/or other digital trade restrictions in China, India, Indonesia, Russia, and Vietnam, while noting the absence of such restrictions in Australia, Canada, Japan, Singapore, the UK, and the US. https://cloudscorecard.bsa.org/2018/pdf/BSA_2018_Global_Cloud_Scorecard.pdf.
- The 2019 OECD *Digital Trade Restrictiveness Index* ranks China, India, Indonesia, and Russia among the most digitally trade restrictive major economies, and ranks Australia, Canada, Japan, Switzerland, the UK, and the US among the least trade restrictive major economies. https://stats.oecd.org/Index.aspx?DataSetCode=STRI_DIGITAL.
- The 2020 Tufts University *Digital Intelligence Index* observes that, "[l]ess data protectionism coupled with stronger data privacy protections will improve competitiveness and innovation…Singapore, Japan, Canada, and the Netherlands, illustrate this approach well, with greater openness to data flows and strong privacy protections. Economies…such as China, Russia, Turkey, and Saudi Arabia score poorly on both these measures." https://sites.tufts.edu/digitalplanet/files/2020/12/digital-intelligence-index.pdf.

For comparability purposes, we recalculated each of the foregoing report rankings (where necessary) as a percentage (out of 100 points). EU member states are omitted from this analysis because of comparability challenges in separating EU-wide policies from specific member state policies.

[12] *See generally*, World Trade Organization, The TRIPS Agreement and COVID-19 (2020), https://www.wto.org/english/tratop_e/covid19_e/trips_report_e.pdf.

[13] This chart comprises data from the 2019 WIPO *Global Innovation Index* and the Global Innovation Policy Center's 2019 *IP Index*.

- The Global Innovation Policy Center's 2019 *IP Index* ranks Japan, Singapore, Switzerland, the UK, and the US among the top major innovation economies, while placing China, India, Indonesia, and Russia in the lower half of its rankings. https://www.theglobalipcenter.com/ipindex2019-chart/.
- The 2020 *Global Innovation Index* ranks Singapore, Switzerland, the UK, the US, and several other European countries among the top major innovation economies, while placing China, India, Russia, and Indonesia in the 14th, 47th, 48th and 85th positions respectively. It bears noting that China is ranked in the 14th position, although there is an ongoing public debate regarding the role of non-commercial considerations (e.g., subsidies for patent and trademark filings, incidence of bad faith trademark applications, etc.) in driving high rates of trademark and patent filings in China. https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2020.pdf.

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[14] H. Dernis, P. Gkotsis, N. Grassano, S. Nakazato, M. Squicciarini, B. van Beuzekom, A. Vezzani, *World Corporate Top R&D Investors: Shaping the Future of Technologies and of AI*, A joint JRC and OECD Report (2019), http://www.oecd.org/sti/world-corporate-top-rd-investors-shaping-future-of-technology-and-of-ai.pdf.

[15] MIT Sloan Business Management Review, *Accelerating Digital Innovation Inside and Out: Findings from the 2019 Digital Business Global Executive Study and Research Project* (2020), https://sloanreview.mit.edu/projects/accelerating-digital-innovation-inside-and-out/.