# ZONING DATA FLOWS

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*Abstract*

*This article explores how China is developing a unique location-based data outbound deregulation regime to mitigate the negative effects of its initial security-driven regulations. A major move is repurposing free trade zones with data outbound negative lists. Using an infrastructural-thinking framework, this article examines the evolution of data outbound regulation in China, recent initiatives in the country's free trade zones, and the dynamics between local and central governments. China's data outbound practices are enabled and constrained by its global information and telecommunication (ICT) infrastructural connectivity and domestic distribution. Free trade zones become appealing deregulation testing grounds due to their overlap with critical ICT hub locations and their role as sites for policy experimentation. The ongoing pilot projects, through the interplay of law and infrastructure, present promising potential to channel China's data outbound activities into specific areas, thereby increasing their visibility, making them more amenable to regulation, and fostering both local and national economies.*

*Keywords: Data Outbound Regulation; Digital Infrastructure; Policy Experimentation; Free Trade Zones; Digital Economy; Data Flow*

## I. INTRODUCTION

Free flow of data is a long-standing concept,[1] from the 1996 Manifesto on the Independence of Cyberspace[2] to the more recent idea of data free flow with trust.[3] However, it is often stated that the "era" of free data flow is coming to an end.[4] One of the signature events happened in 2013, when the Snowden revelations prompted many jurisdictions to shift towards data sovereignty paradigm, driven by

[1] Instances of states actively imposing restrictions on outbound data flow were once restrained and in the minority. *See* Martina F. Ferracane, *Restrictions on Cross-Border Data Flows: A Taxonomy*, EUR. CTR FOR INT'L POL. ECON. (Nov. 27, 2017), https://ecipe.org/publications/restrictions-to-cross-border-data-flows-a-taxonomy/ [https://perma.cc/VPQ5-Q2WS].

[2] John Perry Barlow, *A Declaration of the Independence of Cyberspace*, Electronic Frontier Foundation (Feb. 8, 1996), https://www.eff.org/cyberspace-independence [https://perma.cc/Z95F-JQXQ].

[3] OECD, *Moving Forward on Data Free Flow with Trust: New Evidence and Analysis of Business Experiences*, OECD Digital Economy Papers, No. 353 (Apr. 27, 2023), https://doi.org/10.1787/20716826.

[4] *See, e.g.*, David McCabe & Adam Satariano, *The Era of Borderless Data Is Ending*, N. Y. TIMES, May 23, 2022, https://www.nytimes.com/2022/05/23/technology/data-privacy-laws.html.

cybersecurity concerns and strategic competition.[5] Another major moment came with the European General Data Protection Regulation (GDPR), which set a "global" standard for personal data protection.[6] These forces gradually combined, leading to increased legal barriers to data flow for data protection and privacy, national and cyber security, sovereignty, and individual or collective autonomy.[7] By June 2022, 75% of all countries have implemented some level of data localization rules.[8] Even the United States, the original proponent and major beneficiary of global free data flow, have reversed its stance both domestically and internationally.[9] Its shift culminated on April 24, 2024, when President Biden signed a sweeping foreign aid bill into law, which includes the Protecting Americans' Data from Foreign Adversaries Act. This Act essentially prohibits data brokers from transferring personally identifiable sensitive data to "any foreign adversary country" including the People's Republic of China (China), and "any entity that is controlled by a foreign adversary."[10]

In mainstream legal discourse, China is often portrayed as one of the earliest and most restrictive jurisdictions when it comes to regulating outbound data.[11] Over the past three years, China has introduced a comprehensive package of regulations, led by the so-called "Troika" Laws: Cybersecurity Law, Data Security Law, and Personal Information Protection Law (PIPL). While data protection and privacy are sometimes mentioned alongside security as reasons for restricting data outbound—such as in the case of Didi being fined RMB 8 billion under PIPL for illegally collecting and analyzing personal information—the investigation into Didi seemed to be also driven by national security concerns and conducted through a cybersecurity

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[5] *See*, *e.g.*, Milton Mueller, *Against Sovereignty in Cyberspace*, 22 INT. STUD. REV. 779, 779–801 (2020); John Selby, *Data Localization Laws: Trade Barriers or Legitimate Responses to Cybersecurity Risks, or Both?*, 25 INT'L. J. L. INFO. TECH. 213, 213–232 (2017).

[6] ANU BRADFORD, THE BRUSSELS EFFECT: HOW THE EUROPEAN UNION RULES THE WORLD 131–170 (2020).

[7] Patrik Hummel et al., *Data Sovereignty: A Review*, 8 BIG DATA & SOC'Y 1, 1-17 (2021). For further discussion of data sovereignty, *see* DATA SOVEREIGNTY: FROM THE DIGITAL SILK ROAD TO THE RETURN OF THE STATE (Anupam Chander & Haochen Sun eds., 2023).

[8] Satyajit Parekh et. al., *Localization of Data Privacy Regulations Creates Competitive Opportunities*, MCKINSEY & COMPANY (June 30, 2022), https://www.mckinsey.com/capabilities/risk-and-resilience/our-insights/localization-of-data-privacy-regulations-creates-competitive-opportunities; Nigel Cory & Luke Dascoli, *How Barriers to Cross-Border Data Flows Are Spreading Globally, What They Cost, and How to Address Them*, INFO. TECH. & INNOVATION FOUND. (July 19, 2021), https://itif.org/publications/2021/07/19/how-barriers-cross-border-data-flows-are-spreading-globally-what-they-cost/.

[9] David Lawder, *US Drops Digital Trade Demands at WTO to Allow Room for Stronger Tech Regulation*, REUTERS, Oct. 26, 2023, https://www.reuters.com/world/us/us-drops-digital-trade-demands-wto-allow-room-stronger-tech-regulation-2023-10-25/.

[10] H.R. 815, 118th Cong. § 1(a)(9) (2023-2024); *see also*, *FACT SHEET: President Biden Issues Executive Order to Protect Americans' Sensitive Personal Data*, WHITE HOUSE (Feb. 28, 2024), https://www.whitehouse.gov/briefing-room/statements-releases/2024/02/28/fact-sheet-president-biden-issues-sweeping-executive-order-to-protect-americans-sensitive-personal-data/ [https://perma.cc/K8MC-C7ZJ].

[11] *See, e.g.*, Yanqing Hong, *The Cross-Border Data Flows Security Assessment: An Important Part of Protecting China's Basic Strategic Resources* (Yale L. Sch. Paul Tsai China Ctr. Working Paper, June 20, 2017); Xudong Jiang, *Governing Cross-Border Data Flows: China's Proposal and Practice*, 8 CHINA Q. INT'L STRATEGY STUD. 21, 21–37 (2022), https://doi.org/10.1142/S2377740021500214.

review process.[12] Security concerns and state interests are often strongly interconnected, leading to the view that China employs a state-centric or state-led model of regulation for cross-border data flow.[13]

We argue, however, that an overemphasis on security overshadows the full scope of China's data outbound regulation. Despite growing concerns over outbound data risks, China's economy continues to rely heavily on digital trade and associated activities (e.g., logistics, payment, finance, investment, enterprise operations, R&D).[14] The Chinese government consistently signals its support for promoting cross-border trade and investment,[15] with digital trade being a significant component.[16] Note that the enduring and comparative success in economic growth has been recognized as a key pillar in sustaining the government's legitimacy in China, alongside maintaining social stability and achieving "good governance."[17] The dynamics of these factors are constantly evolving to ensure the country's performance.[18] The need to find the right equilibrium gives the Chinese government strong incentives to carefully craft regulations governing outbound data flow, especially considering the substantial role cross-border digital trade plays in its economy.[19]

The uphill battle lies in *how* to regulate outbound data to achieve multiple policy goals. Like many jurisdictions, China wants to maintain security-driven restrictions to address genuine risks while preserving efficient data flow for vital

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[12] *See, e.g.,* Mingli Shi et al., *Forum: Unpacking the DiDi Decision*, DIGICHINA (July 22, 2022), https://digichina.stanford.edu/work/forum-unpacking-the-didi-decision/ [https://perma.cc/QR99-Y7R9]; *Wangluo Anquan Shencha Bangongshi Guanyu Dui "Didi Chuxing" Qidong Wangluo Anquan Shencha de Gonggao* (网络安全审查办公室关于对"滴滴出行"启动网络安全审查的公告) [*China's Cyberspace Administration Announces Launch of Cybersecurity Review for DiDi*], ZHONGGUO WANGXIN WANG (中国网信网) [CYBERSPACE ADMINISTRATION OF CHINA WEBSITE] (July 2, 2021), https://www.cac.gov.cn/2021-07/02/c_1626811521011934.htm [https://perma.cc/XX4S-ZEKX].

[13] *See generally* Douglas W. Arner et al., *The Transnational Data Governance Problem*, 37 BERKELEY TECH. L. J. 623 (2022).

[14] *Digital Sector Roadmap to Aid Recovery*, CHINA DAILY (Dec. 9, 2023), https://english.www.gov.cn/news/202312/09/content_WS6573d73dc6d0868f4e8e204a.html [https://perma.cc/4DA4-5DK2] (stating that China's digital economy accounted for 41.5% of the country's GDP); MARTINA F. FERRACANE, *The Costs of Data Protectionism*, *in* BIG DATA & GLOB. TRADE L. 63–82 (Mira Burri ed., 2021) (arguing that the impact of proposed and enacted data restrictions on GDP is substantial in China).

[15] *See, e.g.*, *Kuajing Maoyi Touzi Kaifang Zhengce Zai Jiama, Gei Qiye Dailai Shenme Lihao?* (跨境贸易投资开放政策再加码，给企业带来什么利好?) [*What Benefits Will Enterprises Gain from the Intensified Policies Aimed at Further Opening up Cross-border Trade and Investment?*], XINHUA, Dec. 20, 2023, http://www.news.cn/fortune/2023-12/20/c_1130036390.htm [https://perma.cc/87CL-LSJG].

[16] *China Increases Digital Trade in Its Opening-up Endeavors*, XINHUA, Oct. 26, 2023, http://english.scio.gov.cn/m/chinavoices/2023-10/26/content_116775376.htm [https://perma.cc/6SVY-KCYD].

[17] *See, e.g.*, Yuchao Zhu, *"Performance Legitimacy" and China's Political Adaptation Strategy*, 16 J. CHINESE POL. SCIENCE 123 (2011).

[18] Taisu Zhang, *Xi's Law-and-Order Strategy: The CCP's Quest for a Fresh Source of Legitimacy*, FOREIGN AFF. (Feb. 27, 2023), https://www.foreignaffairs.com/china/xis-law-and-order-strategy [https://perma.cc/6XRW-CNUM].

[19] *Shuzi Maoyi Shi Woguo Maoyi Guimo Chixu Wenbu Zengzhang de Xin Dongli* (数字贸易是我国贸易规模持续稳步增长的新动力) [*Digital Trade: A New Driving Force for the Steady Growth of China's Trade Scale*], MOFCOM OFF. WEBSITE (Mar. 1, 2024), http://tradeinservices.mofcom.gov.cn/article/szmy/zjyjgd/202403/161977.html [https://perma.cc/L2BD-FK9L].

economic activities. To accomplish this, regulators face two main challenges: *visibility* and *feasibility*. Initial attempts by Chinese regulators involve categorizing outbound data into different tiers and implementing layered supervisory mechanisms. These initial attempts at regulating outbound data have led to trade backlashes.

In this Article, we explore how new data (de-)regulations are being developed in piloting free-trade zones to mitigate the negative impacts on trade. These zones host a majority of companies with extensive cross-border interactions and relatively competent infrastructures for cross-border trade.[20] We argue that through such a combination of sticks (deterrents) and carrots (incentives), data outbound regulations function not merely to constrain behavior but further to channel cross-border industries and businesses with digital elements to existing or emerging clusters. This approach aims to achieve the dual goal of visibility and feasibility in data regulation while aligning with long-term economic policies. Chronologically, the Chinese government first established high legal barriers for outbound data flow across the nation, imposing substantial compliance costs on businesses. Later, it started to lower these barriers and offer favorable commercial conditions in specific, strategically located areas through a combination of legal tools and global and domestic information and telecommunication (ICT) infrastructures.

This Article employs a multi-disciplinary framework to examine China's data outbound regulation using insights from infrastructural studies, economics, political economy, combined with socio-legal analysis. Section II analyzes the global infrastructural setup in which China's data outbound operates, pre-determining the locations where domestic businesses and industries can be best channeled. This global environment, shaped by trade and conflict over the past two centuries, has seen the Chinese government strive to improve global telecommunication infrastructures—enhancing China's connectivity to the world under unique international political conditions. Section III unpacks China's legal framework regarding data outbound and identifies the regulatory dilemma it faces. Section IV explores China's domestic ICT infrastructures, focusing on how piloting programs and scale-up efforts represent forms of policy experimentation and infrastructural developmentalism within China's approach to data governance. Our work contributes to the literature on policy learning and scale-up, emphasizing the unique role of ICT infrastructures in the context of data outbound. Section V concludes.

[20] *See China Free Trade Zones*, TETRA CONSULTANTS, https://www.tetraconsultants.com/jurisdictions/register-company-in-china/china-free-trade-zones [https://perma.cc/26AE-DFZQ] (briefly introducing China's free trade zones with an infrastructural perspective). For a theoretical analysis of China's free trade zones, see Delei Peng & Xiuyan Fei, *China's Free Trade Zones: Regulatory Innovation, Legal Assessment and Economic Implication*, 50 CHINESE ECON. 238 (2017).

## II. GLOBAL ICT INFRASTRUCTURES AND CHINA'S INITIATIVE

### *A. Global Data Flow as Regulated by Infrastructure: Enabling and Constraining*

Digital connectivity is not an automatic phenomenon but something that depends on physical ICT infrastructures. Such infrastructures include terrestrial and submarine cables, along with satellite, cellular, and other wireless technologies.

For those of you who enjoy a "seamless" around-the-clock Internet connection and are likely reading this article via TCLR's website, celebrating life's moments online, these infrastructures mainly *enable* rather than *regulate* the way data flow as it is and is supposed to be "seamless." However, consider a scientist working in Antarctica. Internet access there is limited to specific time windows when satellites pass overhead to connect with local antennas. Personal mobile devices often cannot be connected at all due to lack of supporting infrastructure.[21] While Antarctica' situation might seem extreme—Antarctica is the only continent today lacking submarine cable connectivity—this case underscores a broader point about how infrastructure both *enables* and *constrains* data flow.

To further illustrate, let's look at AWS Snowmobile. AWS Snowmobile is an 18-wheeler truck that can store up to 100 PB of data and physically transport it to the Amazon Web Service (AWS) cloud:

> "If you need to move massive amounts of data, AWS Snowmobile is an Exabyte-scale data transfer service. Each Snowmobile is a 45-foot [roughly 13.7-meter] long ruggedized shipping container hauled by a trailer truck with up to 100 PB [which is $10^8$ GB] data storage capacity. Snowmobile also handles all of the logistics. AWS personnel transport and configure the Snowmobile. They will also work with your team to connect a temporary high-speed network switch to your local network. The local high-speed network facilitates rapid transfer of data from within your datacenter to the Snowmobile. Once you've loaded all your data, the Snowmobile drives back to AWS where the data is imported into Amazon S3."[22]

In March 2024, Amazon retired its Snowmobile truck-based data transfer service after eight years of operation, redirecting users to alternative data transport services that utilize different physical infrastructures.[23] The regulation of data flow by infrastructure is indeed a dynamic *process* rather than a set of static physical limitations. Old infrastructures may be retired, and new ones can be created. In the case of

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[21] *See*, *e.g.*, *Information Technology and Communications Services*, UNITED ANTARCTIC PROGRAM, https://www.usap.gov/technology [https://perma.cc/XT2X-Z3BG].

[22] *An Overview of AWS Cloud Data Migration Services*, AWS WHITEPAPER (May 3, 2024), https://docs.aws.amazon.com/pdfs/whitepapers/latest/aws-overview/aws-overview.pdf?did=wp_card&trk=wp_card.

[23] Jordan Novet & Annie Palmer, *Amazon cloud unit kills Snowmobile data transfer truck eight years after driving 18-wheeler onstage*, CNBC (Apr. 17, 2024), https://www.cnbc.com/2024/04/17/aws-stops-selling-snowmobile-truck-for-cloud-migrations.html.

Antarctica, technology advancements such as Elon Musk's Satellite Internet service, Starlink, and new projects to build smart submarine cables connecting Antarctica are set to transform how data moves to and from the continent.[24] Existing infrastructures also require maintenance, restoration, or upgrades. Decisions regarding these processes are not merely *technical* but are deeply intertwined with *social* and *organizational* factors. Law interacts with all three aspects—technical, social, and organizational—of infrastructures that co-regulate data flow.

This Article draws insights from the *Infrastructures as Regulation* (InfraReg) project at New York University School of Law to inform our analytical framework. The InfraReg project seeks to understand how transnationally-connected infrastructures influence social orders.[25] The core idea is that the technical aspect of infrastructure is not independent of its organizational forms, social relations and economic structures, all of which are shaped by law as well as generative of law as a social construct. As Professor Benedict Kingsbury puts it:

> "*Thinking infrastructurally* typically entails understanding infrastructure not simply as a thing, but as a set of relations, processes and imaginations. One well-established approach brings together the technical (the designed and engineered physical and software elements), the social (the human and non-human actants in their intricate relations), and the organizational (the forms of entity, regulatory arrangements, financing, inspection, governance, etc.)."[26]

### *B. Cross-Border ICT Infrastructures*

To analyze China's outbound data policy, it is essential to begin with the global cross-border ICT infrastructures that *enable* and *constrain* data transmission, forming the global context within which China's policy operates.

Generally, over 95% of international communications are carried on by *fiber-optic submarine cables*.[27] While satellites handle some traffic, they have limited capacities and often come at a higher cost.[28] Submarine cables are essential for

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[24] Allegra Rosenberg, *How Antarctica's history of isolation is ending—thanks to Starlink*, MIT TECH. REV., Feb. 16, 2024, https://www.technologyreview.com/2024/02/26/1088144/antarctica-starlink-elon-musk-satellite-internet/.

[25] INST. FOR INT'L L. & JUST., *InfraReg*, https://www.iilj.org/infrareg/infrareg-project/.

[26] Benedict Kingsbury, *Infrastructure and InfraReg: on rousing the international law 'Wizard of Is'*, 8 CAMBRIDGE INT'L L. J. 171, 179 (2019).

[27] 99% is a number often quoted by media. *See*, *e.g.*, *Damage to undersea cables is disrupting internet access across Africa*, THE ECONOMIST (Mar. 21, 2024), https://www.economist.com/middle-east-and-africa/2024/03/21/damage-to-undersea-cables-is-disrupting-internet-access-across-africa. There is some debate as to whether this data still reflects the true situation. According to TeleGeography researchers, the data is still valid, but precise calculations cannot be made without information on intercontinental satellite traffic. Alan Mauldin, *Do Submarine Cables Account For Over 99% of Intercontinental Data Traffic?*, TELEGEOGRAOHY BLOG (May 4, 2023), https://blog.telegeography.com/2023-mythbusting-part-3 [https://perma.cc/L8XD-QH8P].

[28] Douglas Burnett et al., *Why Submarine Cables, in* SUBMARINE CABLES: THE HANDBOOK OF LAW AND POLICY 3 (Douglas R. Burnett et al. eds., 2013).

transmitting huge amounts of business and financial data across oceans.[29] Businesses depend on submarine cables to provide global services.[30] Submarine cables are subject to some degree of legal regulation, or more precisely, protection, under international law, such as the United Nations Convention on Law of the Sea (UNCLOS).[31] The UNCLOS was drafted with the goal of "facilitat[ing] international communication,"[32] recognizing that such communication is "a common good that was the foundation of the increasing globalization and interconnectedness of the world."[33] According to Articles 79 and 87 of the UNCLOS, all States are entitled to lay submarine cables on the continental shelf and the high seas.[34]

The existing fiber-optic network is a result of decisions made by hybrid profit-making businesses around the globe. This network of submarine cables is highly concentrated, as illustrated in Figure 1. When planning and constructing new fiber-optic cables, cable companies tend to follow routes that were previously used, such as during the telegraph era.[35] This approach is arguably driven by sound economic reasons, as detailed information about the environmental conditions of these routes is readily available, including aspects like seabed topography, sediment types, potential natural hazards, and their recorded effects on infrastructure.[36] Meanwhile, such concentration led to a largely unequal distribution of connectivity, and inherited the legacy of colonial trade and imperial routes as the early global communication network was mainly shaped by forces of trade and war.[37]

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[29] *Id*, at 1. Every day, the Society of Worldwide Interbank Financial Telecommunications (SWIFT) needs to transmits 44.8 million messages to over 11,500 financial institutions in over 200 countries and territories. SWIFT, ANNUAL REVIEW 2022, 7 (2023).

[30] For example, Netflix operates completely on the AWS cloud to transmit over 10,000 streams globally starting every second at peak times. *Netflix Case Study*, AMAZON WEB SERVICES (2016), https://aws.amazon.com/solutions/case-studies/netflix-case-study/ [https://perma.cc/P32C-7ZN4].

[31] The International Cable Protection Committee acts as a forum for international cooperation and provides technical, legal, and environmental information about submarine cables, and has had a consultative status with the United Nations since April 2018.

[32] U.N. Convention on the Law of the Sea preamble, Dec. 10, 1982, 1833 U.N.T.S. 397. [hereinafter UNCLOS].

[33] Tara Davenport, *Submarine Communications Cables and Law of the Sea: Problems in Law and Practice*, 43 OCEAN DEV. & INT'L L. 201 (2012), https://doi.org/10.1080/00908320.2012.698922.

[34] UNCLOS art. 79 & 87, *supra* note 32.

[35] Prior to the current state-of-art of fiber-optic, submarine cables have been through three eras with overlapping periods: telegraph electric telegraph (1800–1960), telephone on coaxial submarine cables (1950–1988), and the prevalent fiber-optic submarine cables (1976–today). *See* GÉRARD FOUCHARD, UNDERSEA FIBER COMMUNICATION SYSTEMS 21–52 (2nd ed. 2016) 21, 21–52, https://doi.org/10.1016/B978-0-12-804269-4.00002-7.

[36] Juha Saunavaara & Mirva Salminen, *Geography of the Global Submarine Fiber-Optic Cable Network: The Case for Arctic Ocean Solutions*, 113 GEOGRAPHICAL REV. 1, 9 (2020), https://doi.org/10.1080/00167428.2020.1773266.

[37] JILL HILLS, THE STRUGGLE FOR CONTROL OF GLOBAL COMMUNICATION: THE FORMATIVE CENTURY 1, 1–20 (2002), http://www.jstor.org/stable/10.5406/j.ctt2ttcks.4.

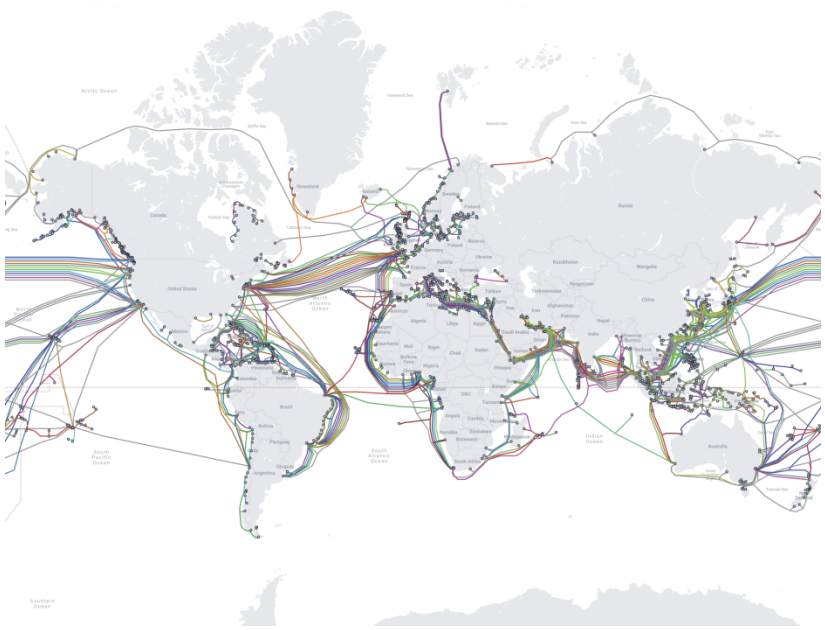

FIGURE 1: SUBMARINE CABLE MAP (SOURCE: TELEGEOGRAPHY)

### *C. Submarine Cable Battle and China's Digital Silk Road*

Despite research indicating that submarine cables can significantly enhance trade, investment, and productivity for a country, [38] their geographical distribution continues to perpetuate inequalities that are unlikely to be resolved easily.[39] Building telecommunication infrastructures between countries involves substantial initial costs and the enduring presence of the cables, safeguarded by international law. Concerns about security—particularly information security and unrestricted access to worldwide information flows—affect the development of new routes and could potentially nudge these routes to take on a different configuration than what would be predicted solely by economic factors.[40]

The vulnerability of global ICT infrastructures stems from risks of foreign espionage and sabotage, which contributes to significant geopolitical tension

[38] *See, e.g.*, COPENHAGEN ECONOMICS, THE ECONOMIC IMPACT OF THE FORTHCOMING EQUIANO SUBSEA CABLE IN PORTUGAL (2021), https://copenhageneconomics.com/publication/the-economic-impact-of-the-forthcoming-equiano-subsea-cable-in-portugal.

[39] Nicole Starosielski, *Fixed Flow: Undersea Cables as Media Infrastructure, in* SIGNAL TRAFFIC: CRITICAL STUDIES OF MEDIA INFRASTRUCTURES 53, 53–67 (Lisa Parks & Nicole Starosielski eds., 2015).

[40] Jack Commins Hart Hasler, Explaining the International Infrastructure of Global Telecommunications: Why Government Ownership Determines a Country's Position in Interstate Communications Networks 12 (Aug. 31, 2020) (Ph.D. dissertation, The George Washington University) (on file with the GW ScholarSpace, The George Washington University), https://scholarspace.library.gwu.edu/etd/8w32r661d.

surrounding new submarine cable construction or extension projects.[41] Although submarine cables are primarily used for civil purposes on a day-to-day basis, their strategic importance in modern conflicts cannot be overlooked.[42] Consequently, there are two levels of tension: first, the routes proposed for new cables, and second, the entities responsible for building them. These tensions are particularly relevant in the context of China's Digital Silk Road (SDR).

China has comparatively fewer submarine cable connections than the United States and a higher concentration of cable landing locations (for landing station and cable details, see Section IV.B.I). To improve its global infrastructural connectivity, China needs to construct new ICT infrastructures, including submarine cables for intra-Asia and inter-continental connections, as well as land cables for neighboring countries and regions. In 2015, China launched the DSR as part of the Belt and Road Initiative, with a key focus on connectivity through digital infrastructures.[43] The DSR has led Chinese technology companies to participate in consortium projects with non-Chinese partners to build physical Internet connectivity infrastructures. Examples include the construction of the Southeast Asia-Japan 2 cable (owned by a consortium including China Mobile and Facebook), the Asia Direct Cable, and investments in new fiber-optic networks such as the hybrid land-submarine cable Pakistan & East Africa Connecting Europe (PEACE), Asia Link Cable, and cross-border land cable networks.[44]

Chinese companies' participation and investment in global ICT projects, such as submarine cables, are influenced and often deterred by the policies of major players like the United States.[45] The United States has imposed several foreign sanction regimes that alter the dynamics of project bidding, impacting how Chinese companies can engage in these initiatives.[46] Abrupt events such as wars and natural disasters like pandemics and earthquakes may also significantly alter this landscape. For example, war may increase the risks of ICT weaponization, potentially decreasing connectivity, while natural disasters may call for greater ICT infrastructural diversity and resilience, increasing the likelihood of new constructions.[47]

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[41] *See, e.g.,* Lane Burdette, *Leveraging Submarine Cables for Political Gain: U.S. Responses to Chinese Strategy*, J. PUB. & INT'L AFF. PRINCETON UNIV. (May 5, 2021), https://jpia.princeton.edu/news/leveraging-submarine-cables-political-gain-us-responses-chinese-strategy.

[42] *See, e.g.*, Raghvendra Kumar, *Securing the Digital Seabed: Countering China's Underwater Ambitions*, 6 J. INDO-PACIFIC AFF. 74 (2023).

[43] *See generally* Matthew S. Erie & Thomas Streinz, *The Beijing Effect: China's Digital Silk Road as Transnational Data Governance*, 54(1) N.Y.U. J. INT'L L. & POL. 1, 48-53 (2021) (discussing digital infrastructure projects in China's DSR).

[44] ERNST & YOUNG, GONGJIAN SHUZI SICHOU ZHI LU JINZHAN XINGSHI YU ZHANWANG (共建数字丝绸之路进展、形式与展望) [BUILDING A DIGITAL SILK ROAD: PROGRESS, STATUS AND OUTLOOK] 17–19 (2023), https://assets.ey.com/content/dam/ey-sites/ey-com/zh_cn/topics/coin/ey-progress-and-outlook-for-jointly-building-the-digital-silk-road.pdf [https://perma.cc/S4NL-CWWT].

[45] Anna Gross et al., *How the US is pushing China out of the internet's plumbing*, FIN. TIMES, June 13, 2023, https://ig.ft.com/subsea-cables/.

[46] *See, e.g.,* Joe Brock, *US China submarine cable dispute*, REUTERS, Mar. 24, 2023, https://www.reuters.com/investigates/special-report/us-china-tech-cables/.

[47] European Comm'n., *Study to monitor connectivity – Connecting the EU to its partners though submarine cables – Final study report*, PUBL'N OFFICE EU, 2022, 47–52, https://data.europa.eu/doi/10.2759/608766.

This global ICT infrastructural landscape sets the context within which domestic regulations and policies must operate when formulating data outbound policies. Specifically, in our case, it influences the piloting processes of data outbound free trade zones and their potential success. Before analyzing these data piloting efforts, we will first provide an overview of China's data outbound regulations, examine the regulatory dilemmas, and discuss how these challenges have led to recent relaxations in free-trade zones in the next Section.

## III. OUTBOUND DATA GOVERNANCE AND THE REGULATORY DILEMMA

### *A. China's Data Outbound Regulation and Its Drivers*

Digital data outbound through submarine cables and Internet is a relatively recent idea. Journey back to February 1994 when the State Council issued the first regulation governing digital data transmission, known as the Security Regulations for Computer Information Systems. It requires that the import and export of "computer information media" be reported to customs.[48] Two months later, China officially joined the global Internet community with a 64K international satellite dedicated line (via Sprint Co. Ltd. of the United States).[49] On May 21, 1994, China's top-lever domain name (CN) server was set up by the Chinese Academy of Sciences, which was placed abroad in SRI-NIC between 1990 and 1994. During 1994 and 1997, four main backbone networks were built and interconnected in China, and public Internet started to become a thing for the general public.[50] Around that time, China was connected to its first two international submarine fiber-optic cable systems, i.e., Shanghai (China) - Miyazaki (Japan) fiber-optic submarine cable system in December 1993, Qingdao (China) -Tai an (South Korea) in February 1996; and first intercontinental submarine fiber-optic cable system, i.e., FLAG Europe Asia in September 1997.[51]

In China, data outbound regulations of today's kind were formulated between 2011 and 2021, driven primarily by concerns for data protection and national security.[52] The regulation started with data localization requirements. In 2013, credit

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[48] Jisuanji Xinxi Xitong Anquan Baohu Tiaoli (计算机信息系统安全保护条例) [Security Regulations for Computer Information Systems] (promulgated by the St. Council, Feb. 18, 1994), art. 12. For an overview of China's cross-border data flow laws and regulations, see Jinhe Liu, *China's Data Localization*, 13 CHINESE J. COMMUN. 84 (2020).

[49] The World Bank provided credit support for this initiative as part of China's National Computing and Networking Facility project. ASIA INTERNET HISTORY PROJECTS, *China: Snapshot of the Internet around 1990*, https://sites.google.com/site/internethistoryasia/book1/snapshot-of-internet-in-china-draft [https://perma.cc/5ZWZ-CAKK].

[50] Shengjun Zhou, *History of Backbone Network in China*, MEDIUM (Feb. 2, 2024), https://medium.com/@xzclass/history-of-backbone-network-in-china-07fec34698d9 [https://perma.cc/X5FR-NF9H].

[51] *General Layout and Characteristics of the Submarine Optical Cable System in China*, *in* SUBMARINE OPTICAL CABLE ENGINEERING 59, 59-86 (Ye Yincan et al. eds., 2018), https://doi.org/10.1016/B978-0-12-813475-7.00003-5.

[52] Before 2011, the government enacted a series of regulation concerning Internet cybersecurity. *See, e.g.*, Jisuanji Xinxi Wangluo Guoji Lianwang Zanxing Guiding (计算机信息网络国际联网管理暂行规定) [Provisional Regulations of the Administration of International Networking of Computer Information] (promulgated by the St. Council, Feb. 1, 1996, amended May 20, 1997) (Chinalawinfo); Jisuanji Xinxi Wangluo Guoji

records were subject to sector-specific data localization rules, followed by population health information in 2014, and map-related data in 2015.[53] These kinds of data are required to be stored (and processed) on servers within China's territory. Data localization requirements in health and credit data were motivated by a mixed interest in individual privacy, national security and public interest,[54] while mapping data localization gave a greater weight to national security.[55] BGI Genomics is believed to be the first enforcement case under these rules, which was fined in 2015 for transmitting genetic data overseas (though the case was not published until 2018).[56]

The Cybersecurity Law in 2016 is the first legislation in China that regulates outbound data flow in a more systematic and direct way. The law expands the regulatory scope from targeting actors in specific sectors to all *critical information infrastructure (CII) operators*. It requires the storage of *personal information* and *important data* collected and produced by CII operators to be localized. If there is a

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Lianwang Anquan Baohu Guanli Banfa (计算机信息网络国际联网安全保护管理办法) [Administrative Measures for the Security Protection of Computer Information Networks Linked to the Internet] (promulgated by the St. Council, Dec. 16, 1997, effective Dec. 30, 1997, amended Jan. 8, 2011) (Chinalawinfo); Jisuanji Xinxi Wangluo Guoji Lianwang Zanxing Guiding Shishi Banfa (计算机信息网络国际联网管理暂行规定实施办法) [Implementation Measures for the Interim Provisions on the Administration of International Networking of Computer Information] (promulgated by Info. Computerization Leaders Grp. St. Council, Feb. 13, 1998) (Chinalawinfo); Guanyu Weihu Hulianwang Anquan de Jueding (关于维护互联网安全的决定) [Decision on Preserving Computer Network Security] (promulgated by the Standing Comm. Nat'l People's Cong., Dec. 28, 2000) (Chinalawinfo). But only one document explicitly addressed outbound data flow in the context of state secret. Jisuanji Xinxi Xitong Guoji Lianwang Baomi Guanli Guiding (计算机信息系统国际联网保密管理规定) [Regulations on Security Management of International Network of Computer Information Systems] (promulgated by the Nat'l Admin. State Secrets Prot., Dec. 27, 1999), art. 7 (Chinalawinfo).

[53] Zhengxin Ye Guanli Tiaoli (征信业管理条例) [Regulation on the Administration of Credit Investigation Industry] (promulgated by the St. Council, Jan. 21, 2013, effective Mar. 15, 2013), art. 24 (Chinalawinfo); Renkou Jiankang Xinxi Guanli Banfa (Shixing) (人口健康信息管理办法（试行）) [Measures for the Administration of Population Health Information (for Trial Implementation)] (promulgated by the Nat'l Health Fam. Plan. Comm'n, May 5, 2014), art. 44 (Chinalawinfo); Ditu Guanli Tiaoli (地图管理条例) [Regulation on Map Management] (promulgated by the St. Council, Nov. 11, 2015, effective Jan. 1, 2016), art. 34 (Chinalawinfo).

[54] Renkou Jiankang Xinxi Guanli Banfa (Shixing) Jiedu (《人口健康信息管理办法（试行）》解读) [Interpretation of Measures for the Administration of Population Health Information (for Trail Implementation)], NAT'L HEALTH COMM'N OFF. WEBSITE (May 13, 2014), http://www.nhc.gov.cn/guihuaxxs/s10742/201405/9992e411fff04a95b03caeda31794c7d.shtml; *Guowuyuan Fazhiban, Renmin Yinhang Fuzeren Jiu Zhengxin Guanli Tiaoli Da Jizhe Wen* (国务院法制办、人民银行负责人就《征信业管理条例》答记者问) [*Q&A with Officials from the Legislative Affairs Office of the State Council and the People's Bank of China on the Regulations on the Administration of Credit Investigation Industry*], MINISTRY OF JUST. OFF. WEBSITE (Jan. 30, 2013), https://www.moj.gov.cn/pub/sfbgw/zcjd/201301/t20130130_390005.html [https://perma.cc/4SU2-K78L].

[55] *Tisheng Fuwu Gongneng Baozhang Xinxi Anquan—Guowuyuan Fazhiban Fuzeren jiu Ditu Guanli Tiaoli Youguan Wenti Da Jizhe Wen* (提升服务功能保障信息安全——国务院法制办负责人就《地图管理条例》有关问题答记者问) [*Enhancing Service Functions and Ensuring Information Security: Q&A with an Official from the Legislative Affairs Office of the State Council on Issues Regarding Regulation on Map Management*], XINHUA (Dec. 14, 2015), https://www.gov.cn/zhengce/2015-12/14/content_5023470.htm [https://perma.cc/Q4YK-CG8J].

[56] *Keji Bu Chufa Huada Jiyin Deng Sheji Weigui Chuandi Ren Yi Ziyuan Xinxi Chujing* (科技部处罚华大基因等涉及违规传递人遗资源信息出境) [*The Ministry of Science and Technology Sanctions BGI and Others for Illegally Transmitting Human Genetic Data Out of the Country*], CAIXIN (Oct. 26, 2018), https://companies.caixin.com/2018-10-26/101339517.html [https://perma.cc/RF5L-VG3M].

need to provide such data overseas for business purposes, the operator must undergo a security assessment.[57] Subsequently, several administrative regulations and TC260 standards were drafted, and most of them only took effect in 2021 and 2022.[58] With the implementation of Cybersecurity Law, policy concerns started to emerge regarding the need to ensure the smooth flow of trade-related outbound data amid tightening regulations.[59]

China kept adding barriers to outbound data flow incrementally up until 2021. Data Security Law were formulated and subsequently implemented in 2021. Data Security Law reaffirms Cybersecurity Law's requirement for CII operators. PIPL extends the restrictions on outbound data flow from personal information stored in CII to personal information at large, and crafts a regime similar to GDPR for cross-border personal information transfer. Under GDPR, transferring data outside the EU needs either an adequacy decision by the EU Commission, or one of the appropriate safeguards including standard contractual clauses, binding corporate rules, approved certificate mechanisms, and approved codes of conduct.[60] Under PIPL, cross-border information transfer needs either passing security assessment by the CAC (for large-scale personal information handlers and CII operators), or implementing one of the appropriate safeguards, including standard contracts and approved certificate mechanisms.[61]

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[57] Wangluo Anquan Fa (网络安全法) [Cybersecurity Law] (promulgated by the Standing Comm. Nat'l People's Cong., Nov. 7, 2016, effective June 1, 2017), art. 37 (Chinalawinfo).

[58] Guojia Hulianwang Xinxi Bangongshi Guanyu Guanjian Xinxi Jichu Sheshi Anquan Baohu Tiaoli Zhengiqu Yijian Gao Gongkai Zhengqiu Yijian de Tongzhi (国家互联网信息办公室关于《关键信息基础设施安全保护条例（征求意见稿）》公开征求意见的通知) [Notice from the Cyberspace Administration of China on Soliciting Public Comments on the Regulations on Protecting the Security of Critical Information Infrastructure (Draft for Comments)] (promulgated by the Cyberspace Admin. China, July 10, 2017) (Chinalawinfo); Guowuyuan Zhengce Chuifenghui: Jiaqiang Guanjian Xinxi Jichu Sheshi Anquan Baohu) (国务院政策吹风会：加强关键信息基础设施安全保护) [State Council Policy Briefing: Strengthening the Security Protection of Critical Information Infrastructure], PEOPLE'S DAILY, Aug. 25, 2021, https://www.gov.cn/zhengce/2021-08/25/content_5633196.htm [https://perma.cc/BX9A-EGMM]; Xinxi Anquan Jishu Guanjian Xinxi Jichu Sheshi Bianjie Queding Fangfa Zhengqiu Yijian Gao (信息安全技术关键信息基础设施边界确定方法（征求意见稿）) [Information security technology—Method of boundary identification for critical information infrastructure (Draft for Comments) ] (promulgated by the Nat'l Info. Sec. Standardization Tech. Comm., May 11, 2024) (Chinalawinfo).

[59] *See, e.g.*, Haiying Li (李海英), *Jiji Canyu Guoji Dianzi Shangwu Guize Zhiding* (积极参与国际电子商务规则制定) [*Actively participate in the formulation of international e-commerce rules*], MOFCOM OFF. WEBSITE (Jan. 9, 2017), http://m.mofcom.gov.cn/article/zt_dzsw135/lanmutwo/201701/20170102498075.shtml [https://perma.cc/P82X-77PN].

[60] Regulation (EU) 2016/679, of the European Parliament and the Council of 27 April 2016 on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of Such Data, and Repealing Directive 95/46/EC (General Data Protection Regulation), 2016 O.J. (L 119).

[61] For the implementation status of the three pathway of data outbound, see Xuanfeng Ning (宁宣凤) et al., *2023 Nian Wangluo Anquan yu Shuju Hegui Huigu yu Zhanwang* (2023年网络安全与数据合规回顾与展望) [*A Review and Outlook on Cybersecurity and Data Compliance in 2023*], KING&WOOD MALLESONS (Feb. 3, 2024), https://www.kwm.com/cn/zh/insights/latest-thinking/review-and-outlook-network-security-and-data-compliance-in-2023.html.

### *B. Backlash on Trade and Rebalance via Zoning*

Cross-border digitally delivered services have emerged as the fastest-growing segment of international trade, accounting for 54% of total service exports according to WTO estimates in 2022. Alongside digitally delivered services, digitally ordered trade is another important component, with its share in exports growing rapidly.[62] Here, international digital trade refers to "[a]ll international trade [i.e. goods and services] that is digitally ordered and/or digitally delivered."[63]

The Troika Laws generate sweeping chilling effects on international digital trade for businesses operating in China. Following the Troika Laws, a series of cybersecurity investigations were initiated against major digital service providers in sectors of transportation (Didi), supply chain solutions (Yunmanman, Truck to Help), and online recruitment (Boss Zhipin) about their data outbound practices.[64] To counter such chilling effects, subsequent administrative measures, guidelines, and enforcement actions were developed to clarify the applied scenarios and obligations under the Troika Laws. However, ambiguity persists. It appears that any data set has the potential to become sensitive for purposes of either data protection (as personal information) or national security (as important data). This all-catching possibility has led to considerable legal risks for companies conducting international digital trade.[65] To mitigate compliance risks, many Chinese businesses have applied for security assessments to the CAC; however, the passing rate remained as low as 1% by the end of 2023, based on publicly available data.[66]

China's data outbound regulation has since not only imposed a heavy administrative burden on businesses but also significantly increased the administrative costs for the designated overseeing agency—the CAC—at all levels. Furthermore, it counters the long-standing efforts of China's Ministry of Commerce (MOFCOM) to foster digital trade. Data flow is fundamental to digital trade, such as international

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[62] IMF ET AL., DIGITAL TRADE FOR DEVELOPMENT 6 (2023).

[63] IMF ET AL., HANDBOOK ON MEASURING DIGITAL TRADE 5-6 (2d ed. 2023).

[64] *See, e.g.,* Yunshu Li (李云舒), *Shuju Guanhu Guojia Anquan* (数据安全关乎国家安全) [*Data Concerns National Security*], CENT. COMM'N FOR DISCIPLINE INSPECTION COMMUNIST PARTY CHINA OFF. WEBSITE (July 7, 2021), https://www.ccdi.gov.cn/toutiao/202107/t20210707_245600.html; Tsinghua Univ. Inst. Intel. Rule L., *Woguo Shuju Anquan Fa Shengxiao Yilai Xingzheng Zhifa Qingkuang Baogao* (我国《数据安全法》生效以来行政执法情况报告) [*Report on Administrative Law Enforcement Since the Implementation of China's Data Security Law*], ANQUAN NEICAN (安全内参) [SECURITY REFERENCE] (June 17, 2023), https://www.secrss.com/articles/55729 [https://perma.cc/V9TU-KA8T].

[65] Tong Qian & Xintong Wang, *China Tightens Controls on Cross-border Data Transfers*, NIKKEI ASIA (June 16, 2023), https://asia.nikkei.com/Spotlight/Caixin/China-tightens-controls-on-cross-border-data-transfers [https://perma.cc/ZSM2-TNGZ]. Foreign companies, especially, demand clarity as they may lack access to the informal channels that Chinese businesses use to acquire information. *See, e.g.*, *Foreign Firms in China See Lack of Feedback on Data Security*, BLOOMBERG (Feb. 29, 2024), https://www.bloomberg.com/news/articles/2024-02-29/foreign-firms-in-china-flag-lack-of-feedback-on-data-security?embedded-checkout=true; Wendy Wu & Kinling Lo, *China's data regulations need more 'clarity', EU companies say in survey*, S. CHINA MORNING POST (Nov. 15, 2023), https://www.scmp.com/economy/china-economy/article/3241529/chinas-data-regulations-need-more-clarity-eu-companies-say-survey.

[66] CGGT, *29 Xiang Shuju Chujing Shenbao Chenggong Anli Fenxi* (29项数据出境申报成功案例分析) [*Analysis of the 29 Successful Reporting Cases for Data Outbound*], SOUHU (搜狐) [SOHU] (Dec. 19, 2023) http://news.sohu.com/a/745379197_610982 [https://perma.cc/F4XD-RCYL].

e-commerce or digitally delivered services including cloud services or streaming subscriptions.[67]

China accessed to the WTO in 1999,[68] with an initial focus on trade in goods, followed by services. Digital trade later emerged as the digitally enabled trade of analog goods and services.[69] This type of digitally enabled trade was first written into China's five-year plan in 2006, with the export of information technology briefly mentioned as one of the service trades to be promoted.[70] In the same year, the MOFCOM launched the "Thousand-Hundred-Ten project (千百十工程)." The MOFCOM is in charge of facilitating foreign trade and fostering international economic collaboration, with a particular focus on engaging in WTO e-commerce negotiations and promoting the growth of digital trade within China. The "Thousand-Hundred-Ten project" aims to promote the export of three types of ICT services: information technology outsourcing (ITO, all digitally delivered), business process outsourcing (BPO, partially digitally delivered), and knowledge process outsourcing (KPO, partially digitally delivered).[71]

The subsequent two five-year plans in 2011 and 2016 featured similar language aimed at promoting digital trade.[72] During this period, China witnessed significant

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[67] *See* Javier López González & Marie-Agnes Jouanjean, *Digital Trade: Developing a Framework for Analysis* (OECD Pub., OECD Trade Policy Papers No. 205, 2017), https://doi.org/10.1787/524c8c83-en; However, it is important to note that data flow does not equal to digital trade. *See* DANIELLE M. TRACHTENBERG, CONG. RSCH. SERV., IFI2347, DIGITAL TRADE AND DATA POLICY: KEY ISSUES FACING CONGRESS (updated Apr. 30, 2024), https://sgp.fas.org/crs/misc/IF12347.pdf [https://perma.cc/KPD2-NWZJ].

[68] China's economic reforms since the 1970s is the starting point when China gave a far greater role to market forces and started a rapid liberalization of its foreign trade regime. In June 1986, China submitted a request to resume its status as a contracting party of the GATT, and is also poised to become a member of the WTO. Sutherland Outlines Challenges and Benefits for China in GATT Membership Negotiations, GATT/1633, May 10, 1994. For a holistic review of China's history of accession to WTO, *see* YANG GUOHUA (杨国华), SHIJIE MAOYI ZUZHI YU ZHONGGUO (世界贸易组织与中国) [WTO AND CHINA] 37-57 (2016).

[69] *See, e.g.*, *Digital Trade*, EUR. COMM'N, https://policy.trade.ec.europa.eu/help-exporters-and-importers/accessing-markets/goods-and-services/digital-trade_en [https://perma.cc/7PRU-MQ9F].

[70] Zhonghua Renmin Gonghe Guo Guomin Jingji he Shehui Fazhan Di Shiyi Ge Wunian Guihua Gangyao (中华人民共和国国民经济和社会发展第十一个五年规划纲要) [The Eleventh Five-Year Plan for National Economic and Social Development of the People's Republic of China] (promulgated by the Nat'l People's Cong., Mar. 14, 2006) (Chinalawinfo).

[71] IMF ET AL., *supra* note 63, at 116 (Case study 2: Towards a better measurement of digitally delivered trade: China's experience and prospects); In 2023, the value of ITO, BPO and KPO respectively reaches 415.4 billion (an annual growth rate of 13.1%), 172.2 billion (an annual growth rate of 17.8%) and 452.2 billion RMB (an annual growth rate of 18.4%). Wenbo Wang (王文博), *2023 Nian Woguo Fuwu Waibao Chanye Baochi Liangwei Shu Zengzhang* (2023年我国服务外包产业保持两位数增长) [*In 2023, China's Service Outsourcing Industry Maintained Double-Digit Growth*], XINHUA: ECONOMIC INFORMATION DAILY (Feb. 5, 2024), http://news.cn/20240205/7013b98194f64513812df3e57ea5eeb9/c.html [https://perma.cc/K2SN-QBRL].

[72] Zhonghua Renmin Gonghe Guo Guomin Jingji he Shehui Fazhan Di Shier Ge Wunian Guihua Gangyao (中华人民共和国国民经济和社会发展第十二个五年规划纲要) [The Twelfth Five-Year Plan for National Economic and Social Development of the People's Republic of China] (promulgated by the Nat'l People's Cong., Mar. 14, 2011) (stating that "we will strive to increase exports of emerging services, including culture, traditional Chinese medicine, software, information, commercial and trade logistics, and finance and insurance. We will vigorously develop service outsourcing and build a number of service outsourcing centers (努力扩大文化、中医药、软件和信息服务、商贸流通、金融保险等新兴服务出口。大力发展服务外

expansion in cross-border digital trade, mainly due to policy support and the gradual development of e-commerce platforms.[73] Within the country, the government consistently prioritized advancing digitalization in both society and the economy. This is exemplified by the 2015 "Internet+" Initiative, which serves as a catalyst for the expansion of e-commerce exports.[74] The most recent Fourteenth Five-Year Plan, along with the MOFCOM's blueprint for executing this plan in 2021, puts an unparalleled emphasis on digital trade and alludes to the crucial role of smooth cross-border data flow for trade activities. The agency also underscores the importance of proper regulations for data transmission across national borders.[75]

However, without the authority to promulgate such regulations—which falls under the purview of the CAC, which prioritizes security—MOFCOM's efforts to promote digital trade are crippled by increasingly stringent data flow restrictions. While the relative nature of data calls for a more expansive understanding of "data" in the context of outbound data regulations, the consequences could be far-reaching and detrimental, potentially leading to chilling effects on a wide range of cross-border digital trade sectors. Therefore, Chinese regulators must find a solution to this regulatory dilemma. Despite MOFCOM's attempts to use policy initiatives to encourage local innovations, which will be discussed later, the effects of such initiatives remained rather limited without the CAC's endorsement. It is worth noting that the competition and coordination between different agencies within the Chinese government have long been studied and found to have a significant impact on the formulation and enforcement of the country's policies and laws.[76] Outbound data governance is no exception to these dynamics.

In March 2024, influenced by MOFCOM's push,[77] the CAC released Provisions on Promoting and Regulating the Cross-Border Flow of Data, which aim to

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包，建设若干服务外包基地).") (Chinalawinfo); Zhonghua Renmin Gonghe Guo Guomin Jingji he Shehui Fazhan Di Shisan Ge Wunian Guihua Gangyao (中华人民共和国国民经济和社会发展第十三个五年规划纲要) [Outline of the 13th Five-Year Plan for National Economic and Social Development of the People's Republic of China] (promulgated by the Nat'l People's Cong., Mar. 16, 2016) (stating that "we will establish systems to facilitate new forms of trade, such as cross-border e-commerce (建立便利跨境电子商务等新型贸易方式的体制).") (Chinalawinfo).

[73] Shuzhong Ma et al., *Rise of Cross-border E-commerce Exports in China*, 26 CHINA & WORLD ECONOMY 63 (2018), https://doi.org/10.1111/cwe.12243.

[74] Guanyu Jiji Tuijin "Hulianwang+" Xingdong de Zhidao Yijian (关于积极推进"互联网+"行动的指导意见) [Guiding Opinions on Actively Promoting the Internet Plus Initiative] (promulgated by the St. Council, July 1, 2015).

[75] Shisiwu Duiwai Maoyi Gaozhiliang Fazhan Guihua (十四五对外贸易高质量发展规划) [Plan for the High-quality Development of Foreign Trade during the 14th Five-Year Plan Period] (promulgated by the Ministry of Com., Nov. 18, 2021).

[76] *See, e.g.*, Hongyi Lai & Su-Jeong Kang, *Domestic Bureaucratic Politics and Chinese Foreign Policy*, 23 J. CONTEMP. CHINA 294 (2014), https://doi.org/10.1080/10670564.2013.832531; Angela Huyue Zhang, *Bureaucratic Politics and China's Anti-Monopoly Law*, 47 CORNELL INT'L L.J. 671 (2014), https://scholarship.law.cornell.edu/cilj/vol47/iss3/6; Thomas F. Remington, *Bureaucratic Politics and Labour Policy in China*, 16 CHINA: AN INT'L J. 97 (2018), https://doi.org/10.1353/chn.2018.0027.

[77] *Shangwubu Zhunbei Tuidong Chutai Guifan He Cujin Shuju Kuajing Liudong Guiding* (商务部：准备推动出台《规范和促进数据跨境流动规定》) [*Ministry of Commerce: Preparing to Promote the Introduction of the Provisions on Regulating and Promoting Cross-Border Data Flow*], YANGSHI WANG (央视网) [CCTV.COM] (Feb. 5, 2024), https://news.cctv.com/2024/02/05/ARTIP6EACQpC0NjixgLQC0Zv240205.shtml [https://perma.cc/BNZ7-L89K].

clarify the scope of data outbound obligations. The Provisions take into account strong trade implications, as evidenced by Articles 3 and 5. Article 3 reads:

> "Where the data collected or produced in activities such as *international trade*, *cross-border transport*, academic cooperation, and *multinational manufacturing and marketing* that is to be provided overseas does not include personal information or important data, it is exempt from declarations for data export security assessments, concluding standard personal information export contracts, and passing personal information protection certification." (*emphasis added*)

Article 5 lists conditions under which data outbound compliance measures are exempted. Its paragraph 1 reads:

> "(1) Where it is truly necessary to provide personal information overseas in order to conclude or perform on contracts to which an individual is a party, such as for *cross-border purchases*, *cross-border delivery*, *cross-border wire transfers*, *cross-border payments*, *cross-border opening of accounts*, *plane and hotel reservations*, *visa handling*, and *testing services*;" (*emphasis added*)

By highlighting specific business scenarios where data outbound is permitted without the need for reporting or other compliance measures, the Chinese government seeks to dispel the perception that it intends to burden international digital trade.

The true innovative policy is introduced in Article 6, pertaining to free trade pilot zones. It reads:

> "Under the hierarchical and classified data protection system, *free trade pilot regions* may themselves formulate lists of data that need to be included within the scope of data export security assessments, standardized contracts for the export of personal data, and personal information protection certification for that region (hereinafter referred to as *negative lists*) , and upon approval from the provincial Commission for Cybersecurity and Information Technology, report it to the National Network Information Department and the National Data Management Department for filing." (*emphasis added*)

This is the first instance of a negative list being incorporated into formal data outbound regulation. However, efforts to promote cross-border data flow in free-trade pilot regions date back to 2019, when the central and local governments started to work in tandem to launch local pilot projects for cross-border data flow in free trade pilot zones/ports like Beijing, Shanghai, and Hainan. In 2021, as part of the Fourteenth Five-Year Plan, these pilot projects for cross-border data flow were further enhanced. These projects aim to explore and improve the regulatory model of cross-border data flow through policy innovation, management upgrades, and service optimization in designated regions. Special focus is given to critical sectors such as artificial intelligence, the industrial Internet, and cross-border e-commerce. The

ultimate goal is to address the practical demands of cross-border data flow and fuel the digital economy.[78]

As of March 2024, among the 21 free trade zones in major Chinese cities, at least six have initiated cross-border data trials. The insights were first drawn from Shanghai. In 2019, Shanghai released a local regulation suggesting that the local government would ease cross-border data flow by adjusting specific data security management mechanisms while providing secure and convenient infrastructure for cross-border data flow.[79] In the same year, the central government unveiled a development outline for China's Greater Bay Area (Guangdong-Hong Kong-Macao), conveying similar ideas for infrastructure construction and the interconnection of cross-border data flow in the region.[80] In August 2020, MOFCOM officially proposed conducting pilot projects on cross-border data flow security management in select advantageous free trade zones.[81] Concurrently, the National Development and Reform Commission (NDRC) issued a development plan for Hainan, which also listed action points related to the construction of cross-border data flow infrastructure like undersea cables, as well as trials with security requirements. These involve the use of advanced security-enhancing technologies and the cultivation of a legal compliance service market for outbound data.[82] Between 2020 and 2022, the

[78] Dep't Pol'y Plan., *Shisiwu Guihua Gangyao Mingci Jieshi Zhi 207 Shuju Kuajing Chuanshu Anquan Guanli Shidian* ("十四五"规划《纲要》名词解释之207｜数据跨境传输安全管理试点) [*Explanation of Terms in the 14th Five-Year Plan Outline No. 207 | Pilot Program for Cross-Border Data Transmission Security Management*], NAT'L DEV. REFORM COMM'N OFF. WEBSITE (Dec. 24, 2021), https://www.ndrc.gov.cn/fggz/fzzlgh/gjfzgh/202112/t20211224_1309474.html [https://perma.cc/39HA-855K].

[79] Zhongguo (Shanghai) Ziyou Maoyi Shiyan Qu Lingang Xinpian Qu Guanli Banfa (中国（上海）自由贸易试验区临港新片区管理办法) [Measures for the Administration of the Lin-Gang Special Area of China (Shanghai) Pilot Free Trade Zone] (promulgated by the Shanghai Mun. Gov't, Aug. 12, 2019, effective Aug. 20, 2019) (Chinalawinfo) [hereinafter *2019 Lingang Measures*]. This local regulation actually built on a central policy document, see Zhongguo (Shanghai) Ziyou Maoyi Shiyan Qu Lingang Xinpian Qu Zongti Fang'an (中国（上海）自由贸易试验区临港新片区总体方案) [Framework Plan for the Lin-gang Special Area of China (Shanghai) Pilot Free Trade Zone] (promulgated by the St. Council, July 27, 2019) (Chinalawinfo).

[80] Yue-Gang-Ao Dawanqu Fazhan Guihua Gangyao (粤港澳大湾区发展规划纲要) [Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area] (promulgated by the Cent. Comm. Communist Party China & the St. Council, Feb. 18, 2019) (Chinalawinfo).

[81] Quanmian Shenhua Fuwu Maoyi Chuangxin Fazhan Shidian Zongti Fang'an (全面深化服务贸易创新发展试点总体方案) [Overall Plan for Comprehensively Deepening the Pilot Program of the Innovative Development of Trade in Services] (promulgated by the Ministry of Com., Aug. 12, 2020) (Chinalawinfo).

[82] Zhihui Hainan Zongti Fang'an (智慧海南总体方案) [Framework Plan for Developing an Intelligent Hainan] (promulgated by the Nat'l Dev. & Reform Comm'n, Aug. 14, 2020) (Chinalawinfo).

governments of Hainan,[83] Shanghai, [84] Zhejiang,[85] Beijing,[86] and Guangdong[87] all introduced relevant plans or implemented concrete measures that follow a similar trajectory. Notably, Shanghai was once again the first to explore the creation of a low-risk outbound data flow catalog (positive list or "whitelist") in 2022.[88]

## IV. CHANNELING DATA FLOW WITH ZONING

China is not unique as a country whose cross-border digital trade is affected by its own (and others') data regulation. Yet, it stands out by utilizing free trade zones to de-regulate outbound data. This location-based approach is somewhat counterintuitive to common perceptions of the Internet, which traditionally de-emphasizes the physical location of a business, allowing e-commerce activities to occur from anywhere. This approach also contrasts with regulatory frameworks like the Data Privacy Framework program (formerly known as Privacy Shield) in the United States. Data Privacy Framework is designed to mitigate the effects of GDPR and "facilitate transatlantic trade."[89] In the U.S., any business, regardless of its location, can participate.

With this unique feature in mind, we will begin by examining how free trade zones provides an ideal environment conducive to experimental legal solutions to address the challenges posed by the Troika Laws (A). Next, we will analyze China's domestic ICT infrastructures and their integration with international systems (B.1-2), explaining how a location-based regulatory approach may prove practical. The section concludes by assessing whether these regulatory and infrastructural efforts can effectively alleviate business burdens and exploring the potential for scaling

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[83] Hainan Ziyou Maoyi Gang Jianshe Zongti Fang'an (海南自由贸易港建设总体方案) [Master Plan for the Construction of Hainan Free Trade Port] (promulgated by the Cent. Comm. Chinese Communist Party & the St. Council, June 1, 2020) (Chinalawinfo).

[84] Shanghai Quanmian Shenhua Fuwu Maoyi Chuangxin Fazhan Shidian Shishi Fang'an (上海全面深化服务贸易创新发展试点实施方案) [Implementation Plan for Comprehensively Deepening the Pilot Program of the Innovation and Development of Trade in Services in Shanghai] (promulgated by the Shanghai Mun. Gov't, Nov. 5, 2020) [hereinafter *2020 Lingang Plan*]; Zhongguo (Shanghai) Ziyou Maoyi Shiyan Qu Lingang Pianqu Tiaoli (中国（上海）自由贸易试验区临港新片区条例) [Regulation on Lin-Gang Special Area of China (Shanghai) Pilot Free Trade Zone] (promulgated by the Standing Comm. Shanghai Mun. People's Cong., Feb. 18, 2022, effective Mar. 1, 2022) (Chinalawinfo) [hereinafter *2022 Lingang Regulation*].

[85] Zhejiang Sheng Shuzi Maoyi Xianxing Shifan Qu Jianshe Fang'an (浙江省数字贸易先行示范区建设方案) [Construction Plan for the Zhejiang Pilot Digital Trade Zone] (promulgated by the Zhejiang Provincial People's Gov't DoC. & the Leading Grp. for Cybersecurity and Informatization Gen. Office, Nov. 2, 2020) (Chinalawinfo).

[86] *See, e.g.*, Beijing Shi Guanyu Dazao Shuzi Maoyi Shiyan Qu Shishi Fang'an (北京市关于打造数字贸易试验区实施方案) [Implementation Plan for the Construction of the Beijing Pilot Digital Trade Zone] (promulgated by the Beijing Mun. Gov't DoC., Sept. 18, 2020) (Chinalawinfo) [hereinafter *2020 Beijing Plan*]; Zhongguo (Beijing) Ziyou Maoyi Shiyan Qu Tiaoli (中国（北京）自由贸易试验区条例) [Regulations for the China (Beijing) Pilot Free Trade Zone] (promulgated by the Standing Comm. Beijing People's Cong., Mar. 31, 2022, effective May 1, 2022) (Chinalawinfo).

[87] *See, e.g.*, Guangdong Sheng Shuju Yaosu Shichanghua Peizhi Gaige Xingdong Fang'an (广东省数据要素市场化配置改革行动方案) [Action Plan for Implementing Data Factor Market Allocation Reforms in Guangdong] (promulgated by the Guangdong Provincial People's Gov't, July 5, 2021) (Chinalawinfo).

[88] *2022 Lingang Regulation*, *supra* note 89, art. 33.

[89] *Data Privacy Framework (DPF) Program Overview*, DPF, https://www.dataprivacyframework.gov/Program-Overview [https://perma.cc/6UFG-6RLF].

these solutions through a combined social-legal analysis using cluster theory and infrastructural developmentalism (B.3).

### *A. Zoning and Policy Experimentation*

Free trade zones are geographic areas within a sovereign state but considered outside its normal customs territory.[90] In China, free trade zones have historically facilitated various economic policy experimentation. China's policy experiments are neither "freewheeling trial and error" nor "spontaneous policy diffusion." Rather, they represent purposeful and coordinated activities aimed at generating novel policy options, which can be subsequently incorporated into official policy-making and scale up.[91] China's first free trade zone was established in Shanghai in September 2013 with its overall mission of exploring "new ways" and "new experiences" for deepening the reform and opening up of Chinese economy. Since then, free trade zones have become a common framework for institutional and policy innovation with local specificities, with a broader goal to combine policy innovation and scale-up.[92]

Sometimes, the policies experimented with by local governments in free trade zones may conflict with existing laws. In 2015, China's Legislation Law was amended to legalize the *ad hoc* practices of the National People's Congress and its Standing Committee in authorizing local "law-breaking" activities. These practices and the amendment have sparked ongoing debates in China concerning the constitutionality and legitimacy of free trade zones.[93] One primary reason for this situation is that, unlike other jurisdictions, China established free trade zones in 2013 without first enacting specific laws to govern them, a gap that still exists today.[94]

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[90] For example, in the Revised Kyoto Convention, Specific Annex D, Chapter 2 defines free zones as "a part of the territory of a Contracting Party where any goods introduced are generally regarded, insofar as import duties and taxes are concerned, as being outside the Customs territory."

[91] Sebastian Heilmann, *Policy Experimentation in China's Economic Rise*, 43 STUD. COMPAR. INT'L DEV. 1, 1–26 (2008), https://doi.org/10.1007/s12116-007-9014-4.

[92] For an overview of China's FTZs, see UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT, *The Role of China's Pilot Free Trade Zones in Promoting Institutional Innovation, Industrial Transformation and South-South Cooperation*, UNCTAD/GDS/2023/5.

[93] Zuozhen Liu & Jiannan Li, *The Rule of Law Experiment in China's Pilot Free Trade Zones: The Problems and Prospects of Introducing Hong Kong Law into Guangdong*, 10 HAGUE J. ON RULE L. 341 (2018) (discussing the integration of Hong Kong legal principles into Guangdong's Pilot Free Trade Zones).

[94] *See, e.g.*, Li Meng (李猛), *Zhongguo Ziyou Mingyi Qu Falü Zhidu de Gouzao Jiqi Wansha*n (中国自贸区法律制度的构造及其完善) [*The Structure and Perfection of China FTZ Legal System*], SHANGHAI DUIWAI JINGMAO DAXUE XUEBAO (上海对外经贸大学学报) [JOURNAL OF SHANGHAI UNIVERSITY OF

Despite the ongoing debate, when enterprises are burdened by the Troika Laws for data outbound, the free trade zone framework provides the first available institutional platform to find innovative ways to mitigate the side effects of such Laws. For MOFCOM and NDRC, there are arguably alternatives to rebalance the trade backlashes, including proposing amendments to the Troika Laws or lobbying CAC for new policy documents. However, the legislative process in China is intricate and notorious for its uncertain and fluctuating timeframes for passing laws,[95] and policy documents at the national level tend to vague in language.

As previously mentioned, Shanghai was the first mover, proposing in 2019 to ease the regulatory burden on businesses in the zone regarding data outbound. This was followed by a series of similar proposals in other free trade zones.[96] As the three outbound data flow mechanisms became more consolidated, a new wave of data initiatives surfaced in free trade zones in 2023.[97] By mobilizing the power and authority granted to local governments through the institutional platform of free trade zones, and leveraging their supercharged incentives to attract investment and stimulate local economy, significant potential emerges for data outbound regulations to be effectively relaxed within an acceptable range for security-focused entities like the CAC.

Businesses' voices are further amplified given China's recent efforts and key interest in joining regional trade agreements, namely the Digital Economy Partnership Agreement (DEPA) and the Comprehensive and Progressive Agreement for

INTERNATIONAL BUSINESS & ECONOMY] 2 (2017) ; Zhang Yu (张煜), *Tuidong Guojia Cengmian Ziyou Maoyi Qu Lifa Shijian Yi Dao* (推动国家层面自贸区立法时机已到) [*The Time is Ripe for National-Level Free Trade Zone Legislation*], JIEFANG RIBAO (解放日报) [JIEFANG DAILY], Mar. 9, 2024, https://www.shanghai.gov.cn/nw4411/20240309/c5e44908ab5b4c9187f700a3bf4a8ce8.html [https://perma.cc/A8P2-5GWM].

[95] Hui Yang (杨惠) & Xiaohong Yu (于晓虹), *Zhongguo Lishixiaoying Yinxiang Yinsu de Zai Shenxi——Jiyu Quanguo Renmin Dadui Huiyi Zhiweiyuan Huiyi Guihua de Shiji Fenxi (1991—2019 Nian)* (中国立法效率影响因素的再审视——基于全国人大常委会立法规划的实证分析（1991—2019 年）) [*Re-examining the Factors Influencing Legislative Efficiency in China: An Empirical Analysis Based on the Legislative Plans of the Standing Committee of the National People's Congress (1991-2019)*], 2 ZHONGGUO FALÜ PINGLUN (中国法律评论) [CHINA LAW REVIEW] 1367 (2022).

[96] Nianli Zhou (周念利) & Tingting Yao (姚亭亭), *Zhongguo Ziyou Maoyi Shiyan Qu Tuijin Shuju Kuajing Liudong de Xianzhuang, Nandian ji Duice Fenxi* (中国自由贸易试验区推进数据跨境流动的现状、难点及对策分析) [*Analysis on the Current Situation, Difficulties and Countermeasures of Promoting Cross-border Data Flow in Free Trade Zones of China*], 3 GUOJI SHANGWU YANJIU (国际商务研究) [INTERNATIONAL BUSINESS RESEARCH] 3, 6 (2021).

[97] Nianli Zhou (周念利) et al., *Woguo Zimaoqu Shuju Kuajing Liudong Shidian Zhidu Chuangxin Yanjiu* (我国自贸区数据跨境流动试点制度创新研究) [*Research on the System Innovation of the Pilot Construction of Cross-border Data Flow in China's Free Trade Zones*], 4 GUOJI SHANGWU YANJI (国际商务研究) [INTERNATIONAL BUSINESS RESEARCH] 86, 89 (2023).

Trans-Pacific Partnership (CPTPP).[98] Following its 2021 applications to both the DEPA and the CPTPP, China established a working group in August 2022 to further discussions regarding DEPA membership.[99] In both treaties, restrictive measures adopted by member parties regarding cross-border data flow are subject to strict scrutiny under the necessity test. In other words, the restrictions cannot be "greater than are required to achieve [a legitimate public policy] objective."[100] Due to the lack of dispute resolution mechanisms and the fact that it does not establish rights and obligations among members, the DEPA permits somewhat more state discretion than the CPTPP.[101] The main distinction between these two agreements and the Regional Comprehensive Economic Partnership (RCEP), which China is currently a party to, is hence the discretion of the state in limiting the flow of data across borders. The RCEP allows for domestic restrictive measures without requiring a necessity test. A party can determine on its own whether adopting regulatory requirements is "necessary" to "achieve a legitimate public policy" or "for the protection of its essential security interests." [102]

All these dynamics have directly impacted how China is advancing its local data pilot projects at both national and subnational level. Local bureaucrats seize the opportunities to align their local plans with the border national goal of treaty accession to attract more attention to their pilot zones. In June 2023, Sichuan rolled out its policy to facilitate cross-border data flow. This marks the first document explicitly stating that the government will proactively align with DEPA's provisions on the free flow of data.[103] One month later, Zhejiang released its 2023-2027 action plan, indicating the government's intention to cooperate on cross-border data flow with DEPA members as well.[104]

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[98] *MOFCOM Regular Press Conference*, MOFCOM OFF. WEBSITE (Nov. 9, 2023), http://english.mofcom.gov.cn/article/news-release/press/202311/20231103454477.shtml#:~:text=He%20Yadong%3A%20China%20officially%20applied,actively%20to%20advance%20relevant%20process [https://perma.cc/SB4B-2Y79]. *See also*, Alex He, *Trade Deals Might Induce Beijing to Bend on Data Restrictions*, CTR. FOR INT'L GOVERNANCE INNOVATION (June 20, 2022), https://www.cigionline.org/articles/trade-deals-might-induce-beijing-to-bend-on-data-restrictions/ [https://perma.cc/D2LA-PN94].

[99] *Commerce Ministry: China Advancing Negotiations on Joining DEPA*, XINHUA (Aug. 23, 2022), https://english.www.gov.cn/statecouncil/ministries/202208/23/content_WS6304085dc6d02e533532f955.html [https://perma.cc/2QT3-LUX9].

[100] Comprehensive and Progressive Agreement for Trans-Pacific Partnership, art 14.11(3), Dec. 1, 2019, 3346 U.N.T.S. 1; Digital Economy Partnership Agreement, art 4.3(3), June 11, 2020, [2020] N.Z.T.S [hereinafter DEPA].

[101] DEPA, annex I, art. 14A.1.This could partially explain why China has been more proactive in pursuing membership in the DEPA.

[102] Regional Comprehensive Economic Partnership, art. 12.15(3), Nov. 15, 2020, [2020] A.T.N.I.F. 1.

[103] Zhongguo (Sichuan) Ziyou Maoyi Shiyan Qu Duijie Gao Biaozhun Tuijin Zhiduxing Kaifang de Yijian (中国（四川）自由贸易试验区对接高标准推进制度型开放的意见) [Opinions on Advancing High-Standards Institutional Opening in the China (Sichuan) Pilot Free Trade Zone] (promulgated by the Sichuan Provincial People's Gov't, June 20, 2023) (Chinalawinfo) [hereinafter *2023 Sichuan Opinions*].

[104] Zhongguo (Zhejiang) Ziyou Maoyi Shiyan Qu Tisheng Xingdong Fang'an (中国（浙江）自由贸易试验区提升行动方案 （2023-2027年）) [Action Plan for Promoting the China (Zhejiang) Pilot Free Trade Zone (2023-2027)] (promulgated by the Zhejiang Provincial People's Gov't, June 28, 2023) (Chinalawinfo).

Past studies indicate that public sector innovation in China primarily originates from local experimentation and subsequently spreads through the decision-making process of the central government.[105] The same trend occurs in piloting data outbound restrictions. The State Council took Shanghai's whitelist practice in its August 2023 opinions. It encouraged local governments in free trade zones to form a positive list of data eligible to transfer cross borders without any security assessment, certification, or contract.[106] Furthermore, local regulators are tasked with developing a specialized platform to offer relevant compliance services.[107] This national-level policy comes with national-level legislative initiatives. Merely a month later, the CAC announced its draft regulation to facilitate the transfer of data across borders, adopting a more progressive strategy, i.e., a negative list in free trade zones. "Negative list" means that only data on the list is required to go through data outbound checks. The list needs to be approved by provincial-level CACs.[108] Shanghai was the first city to respond to these initiatives in February 2024. But the local government adopted a somewhat hybrid approach that included both a whitelist and a blacklist.[109] This cautious move could be attributed to the mixed signals from central policy, as the State Council's action plan, released also in February of the same year, still adhered to the whitelist approach.[110]

In March 2024, the CAC's negative-list approach came into effect.[111] Notably, this approach is the maximum degree of de-regulation a local government may exercise. However, as indicated by the word "may" (可以) in Article 6, the local government is not obligated to implement it. Local data pilots differ in their details. As of the writing of this Article, the Tianjin Municipal Bureau of Commerce published

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[105] Jiannan Wu et al., *Innovation in the Chinese Public Sectors: Typology and Distribution*, 91 PUB. ADMIN. 347, 347–365 (2013), https://doi.org/10.1111/j.1467-9299.2011.02010.x.

[106] Guanyu Jinyibu Youhua Waishang Touzi Huanjing Jiada Xiyin Waishang Touzi Lidu de Yijian (关于进一步优化外商投资环境加大吸引外商投资力度的意见) [Opinions on Further Optimizing the Foreign Investment Environment and Increasing Efforts to Attract Foreign Investment] (promulgated by the St. Council, July 25, 2023) (Chinalawinfo).

[107] *Id.*

[108] Guanyu Guifan he Cujin Shuju Kuajing Liudong Guiding Zhengqiu Yijian Gao Gongkai Zhengqiu Yijian de Tongzhi (关于《规范和促进数据跨境流动规定（征求意见稿）》公开征求意见的通知) [Notice Regarding a Request for Public Comments on the Provisions on Regulating and Promoting Cross-border Data Flow (Exposure Draft)] (published by the C cyberspace Admin. China, Sept. 28, 2023), art. 7 (Chinalawinfo).

[109] Zhongguo (Shanghai) Ziyou Maoyi Shiyan Qu Lingang Xinpian Qu Shuju Kuajing Liudong Fenlei Fenji Guanli Banfa Shixing (中国（上海）自由贸易试验区临港新片区数据跨境流动分类分级管理办法（试行）) [Measures for the Classified and Graded Management of Cross-Border Data Flows in the Lin-gang Special Area of China (Shanghai) Pilot Free Trade Zone (for Trial Implementation)] (promulgated by the Shanghai Lin-gang Special Area Admin., Feb. 8, 2024) (Chinalawinfo).

[110] Zhashi Tuijin Gao Shuiping Duiwai Kaifang Gengda Lidu Xiyin he Liyong Waizi Xingdong Fang'an (扎实推进高水平对外开放更大力度吸引和利用外资行动方案) [Action Plan for Steadily Advancing High-Level Opening Up and Making Greater Efforts to Attract and Utilize Foreign Investment] (promulgated by the Gen. Office St. Council, Feb. 28, 2024) (Chinalawinfo). The action plan also highlights cooperation with DEPA members.

[111] Cujin he Guifan Shuju Kuajing Liudong Guiding (促进和规范数据跨境流动规定) [Provisions for Promoting and Regulating Cross-Border Data Flow] (promulgated by the CAC, Mar. 22, 2024), art. 6 (Chinalawinfo).

the country's first negative list on May 9. Subsequently, on May 16, Shanghai released its first set of "general data lists" (一般数据清单) covering intelligent connected vehicles, public mutual funds, and biomedicine. These lists are accompanied by an operational guide detailing the required procedures for the cross-border transfer of data included in the lists.[112] Shanghai chose the general-data-list approach to further advance strategic industries in the region, including integrated circuits and automobiles.[113] Beijing might adopt a company-list approach in its pilot zones. Under this approach, local authorities would pick a group of eligible companies to benefit from favorable rules.[114] Other free trade zones also started to identify their preferred industries, such as AI and biomedicine in Beijing,[115] and fintech and digital payment in Sichuan.[116]

### *B. Zone, Clusters, and Infrastructural Data Flow*

Repurposing free-trade zones for data governance aims to reduce the business burden associated with data outbound compliance. The success of this strategy depends on the ability to attract businesses to these zones and foster the formation of clusters of various digitally related industries. In cluster theory, zoning is creating geographic concentrations of interconnected companies, suppliers, providers, related industries and associated institutions, i.e., local clusters.117 Such clusters may benefit from economies of agglomeration and generate benefits for firms by sharing common technologies, skills, knowledge, inputs, consumers, and institutions, and further facilitating agglomeration across complementary and related industries. Regional and industrial growth can be accelerated in a supportive cluster setting by improving operational efficiency, which in turn boosts returns on investment, innovation, and company expansion, leading to more jobs and higher productivity.118 In the context of free trade zones, they are usually situated near ports, whether they be sea, air, or land, and many are export-oriented.

China's location-based de-regulation effort is based on the faith that free trade zones in China can emerge as (new) hubs for businesses with significant data outbound needs. This potential is largely realized and made feasible by China's ICT infrastructure in these zones, which connects to the global submarine cable network

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[112] Xinhua Zhao (赵新华) et al., *Shuju Kuajing Xinlujing Shanghai Lingang Xinpianqu Shuju Kuajing Changjinghua Yiban Shuju Qingdan Pingshu* (数据跨境新路径——上海临港新片区数据跨境场景化一般数据清单评述) [*New Pathways for Cross-Border Data: A Review of the General Data List for Cross-Border Data Scenarios in the Lingang New Area of Shanghai*], KING&WOODS MALLESONS (May 21, 2024), https://www.kwm.com/cn/zh/insights/latest-thinking/shanghai-lingang-issues-white-list-to-expedite-overseas-data-transfer.html [https://perma.cc/D7VR-R3GJ].

[113] *See, e.g.*, *2019 Lingang Measures*, *supra* note 79; *2020 Lingang Plan*, *supra* note 84.

[114] This approach aligns with Beijing's overall development strategy to host multinational enterprises. However, it risks violating the non-discrimination requirement under the RECP, as domestic companies may be more likely to be selected. *See* Fengan Jiang, *China's Legal Efforts to Facilitate Cross-border Data Transfers: A Comprehensive Reality Check*, 32 ASIA PAC. L. REV. 81, 90-91 (2024).

[115] *2020 Beijing Plan*, *supra* note 86.

[116] *2023 Sichuan Opinions*, *supra* note 103.

[117] Michael E. Porter, *The Competitive Advantage of Nations*, 68 HARVARD BUS. REV. 73 (1990).

[118] Mercedes Delgado et al., *Clusters and Entrepreneurship*, 4 J. ECON. GEOGRAPHY 495 (2010).

through submarine cable landing stations and/or their virtual proximity to international communication access points.

### 1. Submarine Cable Landing Stations

International submarine cables land on mainland China through Shanghai, Shantou, and Qingdao. Fuzhou, Xiamen land submarine cables from Taiwan. Multiple landing stations are hosted in Hong Kong and Macau. The locations of submarine cable landing sites closely mirror the positions of major treaty ports and concessions in the last century, as well as the chosen regions of free-trade zones for piloting cross-border data flow in today's China.

The notion of undersea cable (telegraph) was initially introduced to China during the Qing Dynasty. In 1870, British Minister Thomas Wade made a request to Zongli Yamen to allow submarine cables to be laid from Hong Kong to Guangzhou, Shantou, Xiamen, Fuzhou, Ningbo, and Shanghai, and landed at treaty ports. Prince Going responded that undersea cables can be laid in the internal seas along China's coast. However, the end of the cables must not come ashore so that it does not interfere with the land routes of the treaty ports, so maintaining defined limits and avoiding confusion or chaos.[119]

The first telegraph cable in the "Far East" was landed by a Danish naval ship in Deep Water Bay, Hong Kong in 1871 and less than two months later illegally and surreptitiously landed at Shanghai by the GNTC.[120] The same year, Shanghai to Nagasaki was also completed by the GNTC.[121] At the time, Hong Kong was ceded to the British Government, and Zongli Yamen made no objection to laying cables in the internal water, while the Qing Government strongly contested any attempt to "land" these cables on the territory of China. The extension further to land on other treaty ports received great resistance from the Qing Government.[122]

The infrastructure of later fiber-optic cables was often built on top of these earlier telegraph and telephone cables, power systems, and trade routes.[123] Following the establishment of the People's Republic of China on October 1, 1949, Shanghai, Shantou and Hong Kong remain the major cities where the majority of international submarine cables land and carry the most international traffic.[124] Up until

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[119] YIQUN XUE (薛轶群), WANLI GUANSHAN YIXIAN TONG JINDAI ZHONGGUO GUOJI TONGXIN WANG DE GOUJIAN YU YUNYONG (万里关山一线通：近代中国国际通信网的构建与运用（1870-1937）) (2022) [CONNECTING ACROSS VAST DISTANCES: THE CONSTRUCTION AND UTILIZATION OF MODERN CHINA'S INTERNATIONAL COMMUNICATION NETWORK (1870-1937)] (see its Chapter 1 on Chinese international communications from the 1870s to the 1900s).

[120] Kurt Jacobsen, *Small Nation, International Submarine Telegraphy, and International Politics: The Great Northern Telegraph Company, 1869–1940*, *in* COMMUNICATIONS UNDER THE SEAS: THE EVOLVING CABLE NETWORK AND ITS IMPLICATIONS 121-145 (Bernard Finn & Daqing Yang eds., 2009)

[121] XUE, *supra* note 119.

[122] STEPHEN R. HALSEY, QUEST FOR POWER: EUROPEAN IMPERIALISM AND THE MAKING OF CHINESE STATECRAFT 121 (2015).

[123] NICOLE STAROSIELSKI, THE UNDERSEA NETWORK 2–3 (2015).

[124] The first international submarine optical-cable system landed in Shanghai in December 1993, connected Shanghai to Kyushua. The first inter-continental submarine cabled system landed in China is Fiber-optic Link Around the Globe (FLAG) in 1997, landed in both Shanghai and Hong Kong. It connects Europe, the Middle East and Asia. Damages to submarine cables have caused great impact on China's global connectivity. *See,*

now, the major cable systems that connect mainland China to the rest of the world include FLAG Europe-Asia in 1997 South-East Asia-Middle East-West Europe 3 (SeaMeWe-3) completed in 1999, Asia Pacific Cable Network 2 (APCN-2) completed in 2002, East Asia Crossing (EAC) in between 2001-2006, FLAG North Asia Loop in 2002, City-to-City Cable System (C2C) in 2002 as an Intra-Asia system which was later merged into the EAC network in 2011 forming (EAC-C2C), Trans-Pacific Express (TPE) in 2008, South-East Asia Japan (SJC) in 2013,[125] Asia Pacific Gateway (APG) in 2016,[126] New Cross Pacific (NCP) in 2019,[127] Asia Direct Cable (ADC) in 2024,[128] Sea-H2X expected to complete in 2024,[129] Southeast Asia-Japan Cable 2 (SJC2) in 2024,[130] Asia Link Cable (ALC) expected to complete in 2025.[131]

Hong Kong, as an important Internet connectivity hub, has eight landing stations that connect to 12 existing submarine cable systems, and several other systems being planned.[132] Among them, there are 2 intra- and 3 inter-continental of cable systems that mainland China do not connect to. They are Asia-America Gateway (AAG) in 2009,[133] TGN-Intra Asia (TGN-IA) in 2009,[134] Asia Submarine-cable Express (ASE)/Cahaya Malaysia in 2012,[135] Asia Africa Europe-1 (AAE-1) in

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*e.g.,* Caixiong Zheng (郑彩雄), *4 Tiao Guoji Hailan Bei Chuanmao Ladun! Guangdong Haijing Zhenpo Yiqi Guoji Hailan Sunhuai An* (4条国际海缆被船锚拉断！广东海警侦破一起国际海缆损坏案) [Four International Submarine Cables Severed by Ship Anchors! Guangdong Coast Guard Solves an International, CHINA DAILY, Jan. 13, 2024, https://gd.chinadaily.com.cn/a/202401/13/WS65a1ee51a310af3247ffbd06.html [https://perma.cc/M83F-ECCF].

[125] For detailed introduction of these cable systems, see *General Layout and Characteristics of the Submarine Optical Cable System in China*, *supra* note 51.

[126] China-US Cable Network (CUCN) was the communication trunk connecting Asia and the United State, which retired in 2016 when APG went online. *Yatai Zhida Hailan Zaihu Kaitong Ji Zhongmei Hailan Zhengshi "Tuixiu"* (亚太直达海缆在沪开通暨中美海缆正式"退休") [Asia-Pacific Direct Submarine Cable Launched in Shanghai, Marking the Official Retirement of the CUCN], PENGPAI (澎拜) [THE PAPER] (Dec. 16, 2016), https://www.thepaper.cn/newsDetail_forward_1581636 [https://perma.cc/6QH4-SEZ6].

[127] *The New Cross Pacific [NCP] Cable System*, SUBMARINE CABLE NETWORKS, https://www.submarinenetworks.com/en/systems/trans-pacific/ncp [https://perma.cc/7NAT-KE7B].

[128] *Asia Direct Cable (ADC) traversing Asia with higher capacity and greater security, helping enterprises digital transformation*, WORLD INTERNET CONFERENCE, Nov. 23, 2023, https://subsites.chinadaily.com.cn/wic/2023-11/23/c_941673.htm [https://perma.cc/4YN8-8WV3].

[129] *SEA-H2X*, SUBMARINE CABLE NETWORKS, https://www.submarinenetworks.com/en/systems/intra-asia/sea-h2x/ [https://perma.cc/LX33-D7QB].

[130] *SJC2*, SUBMARINE CABLE NETWORKS, https://www.submarinenetworks.com/en/systems/intra-asia/sjc [https://perma.cc/6MGV-U22T].

[131] ALC, SUBMARINE CABLE NETWORKS, https://www.submarinenetworks.com/en/systems/intra-asia/alc [https://perma.cc/45BG-GJLU].

[132] *Landing of Submarine Cables in Hong Kong*, OFFICE OF THE COMMUNICATIONS AUTHORITY, https://www.ofca.gov.hk/en/industry_focus/infrastructures/submarine_cables/index.html [https://perma.cc/Z4DZ-JBPH].

[133] *AAG*, SUBMARINE CABLE NETWORKS, https://www.submarinenetworks.com/en/systems/trans-pacific/aag [https://perma.cc/BL4G-H4Z2].

[134] *TGN-IA*, SUBMARINE CABLE NETWORKS, https://www.submarinenetworks.com/en/systems/intra-asia/tgn-ia/tgn-ia-cable-system [https://perma.cc/3KS9-4H6V].

[135] *Submarine Cable Map*, TELEGEOGRAPHY, https://www.submarinecablemap.com/submarine-cable/asia-submarine-cable-express-asecahaya-malaysia [https://perma.cc/ADW5-KJPY].

2017,[136] Cambodia-Hong Kong cable expected in 2025.[137] Based on statistics from TeleGrography, Hong Kong ranked 6 globally as a global Internet hub in 2023, which is defined as the largest metropolitan market for international Internet bandwidth.[138]

| Region | Cities | Cables | | Continents |
|---|---|---|---|---|
| Guangdong | Shantou | APCN-2, ADC, SeaMeWe-3, SJC | *H2HE: connecting Hainan, Guangdong, Hong Kong* | Intra-Asia, Asia-Europe-Africa |
| Hainan | Wenchang, Linshui | SEA-H2X (2024), ALC (2025) | | Intra-Asia |
| Hong Kong | Lantau Island, Deep Water Bay, Chung Hom Kok, Cape D'Aguilar, Tseung Kwan O | APCN-2, AAG, FEA, FLAG North Asia Loop, APG, ASE, ALC (2025), Cambodia-Hong Kong (2025), SeaMeWe-3, TGN-IA, ADC (2024), EAC-C2C, SEA-H2X (2024), SJC, AAE-1 | | Intra-Asia, Asia-North America, Asia-Europe-Middle East, Asia-Europe-Africa |
| Shanghai | Chongming, Nanhui | APG, EAC-C2C, FLAG Europe-Asia, NCP, APCN-2, TPE, SeaMeWe-3 | | Intra-Asia, Europe, Asia-Europe-Middle East, Asia-North America |
| Shandong | Qingdao | EAC-C2C, TPE | | Intra-Asia, Asia-North America |

Table 2: International Submarine Cable Systems and Landing Stations in China (*Data Source: TeleGeography 2024*)

### 2. International Communication Accesses (ICAs)

Communication networks, such as the Internet, are networks of independent networks that interconnect each other in a certain way.[139] In the context of cross-

[136] *AAE–1*, SUBMARINE CABLE NETWORKS, https://www.submarinenetworks.com/en/systems/asia-europe-africa/aae-1 [https://perma.cc/72LG-3RS9].

[137] *Sihanoukville-HK Cable*, SUBMARINE CABLE NETWORKS, https://www.submarinenetworks.com/en/systems/intra-asia/shcs [https://perma.cc/4GEY-WH5Z].

[138] *Top 10 Global Internet Hubs in 2023*, GLOB. INTERNET HUB, https://www.globalinternethub.org/global-internet-hubs [https://perma.cc/PF7X-BD34].

[139] In the case of Internet, these independent networks are called autonomous systems, and the protocol is BGP. The direct measurement of AS number is difficult due to lack of measurement infrastructure. *See* Eugenio Neri Nemmi et al., *The Parallel Lives of Autonomous Systems: ASN Allocations vs. BGP*, IMC'21:

border communication, international traffic and domestic traffic often meet at a place called national-level backbone networks. The backbone network is a term often used to describe a network layer that connects higher-level networks with lower-level local networks, metaphorically like interstate highways of communication networks. For example, ChinaNet's current architecture is composed of national-level backbone networks and metropolitan area networks.[140] Beijing, Shanghai and Guangzhou are equipped with International Gateways and belong to ChinaNet's backbone network.[141] These service transfer points between a domestic communication network and an international one are called international communication service accesses (ICSAs).[142]

According to Measures on the Administration of International Communication Accesses, international communication service accesses (ICSAs) have to be established by a wholly state-owned telecommunication business operator, i.e., China Mobile, China Unicom, and China Telecom. Public networks with national-level backbone networks are currently operated by China Telecom (ChinaNet), China Unicom (China169), and China Mobile (CMCET). In addition to these general public facing networks, there are several suer-specific backbone networks. The China Education and Research Computer Network (CERNET) has recently come to the attention of the public due to the 10-year Future Internet Technology Infrastructure project. It's a collaboration project between Tsinghua University, China Mobile, Huawei and CERNET that has recently launched the world's fastest Internet with a 1.2 terabit per second link.[143]

A common feature of these public backbone networks is that they all designate Beijing, Shanghai and Guangzhou as core nodes in the network which are responsible for the interconnection of the whole network with the international Internet.[144] This is primarily because these three cities are the only locations with full-service

PROC. OF THE 21ST ACM INTERNET MEASUREMENT CONF. 593 (2021), https://doi.org/10.1145/3487552.3487838.

[140] These networks include China Science & Technology Network (CSTNet), China Public Computer Internet (ChinaNet), China Education and Research Computer Network (CERNet), and China Golden Bridge Information Network (ChinaGBN).

[141] *See, e.g.,* Global Infrastructure Map, CHINA TELECOM, https://www.ctamericas.com/wp-content/uploads/2023/02/China-Telecom-Global-Infrastructure-Map.pdf [https://perma.cc/6YCJ-E7D2]. In this article, an international gateway is defined using the ITU definition: any facility through which electronic communications (voice, data, and video) can be sent between the domestic networks of one country and another.

[142] ICBAs refer to (i) international switch offices of telephone business network (or signal transfer points of international telephone business network); (ii) frame relays, digital data networks (DDN), international switch offices of ATM business networks; (iii) routers of international access of Internet; (iv) other business transfer points between a domestic communication business network and an international communication business network.

[143] Zhang Tong, *China launches world's fastest internet with 1.2 terabit per second link, years ahead of forecasts*, S. CHINA MORNING POST, Nov. 14, 2023, https://scmp.com/news/china/science/article/3241453/china-launches-worlds-fastest-internet-12-terabit-second-link-years-ahead-forecasts.

[144] Guoji Tongxin Churukouju Guanli Banfa (国际通信出入口局管理办法) [Measures on the Administration of International Communication Accesses] (promulgated by the Ministry of Info. Indus., June 26, 2022, effective Oct. 1, 2022) (Chinalawinfo).

ICSAs, and only full-service ICSAs can offer public Internet service.[145] Regional ICSAs are limited to data private line service and often built in coastal and border cities. While there are an increasing number of regional ICSAs being approved by the Ministry of Industry and Information Technology in recent years,[146] Beijing, Shanghai and Guangzhou remain the only three cities with full-service ICSAs.

Owing to such network architecture, if data is transmitted through the public Internet, the proximity of your data to the full-service ICSAs can significantly impact the speed and quality of your data transmission. Being virtually closer to these ICSAs means less traffic along the routes, and thus faster data transmission outside of China (for outbound data) or data delivery to destinations within China (for inbound data). Thus, the idea of an "international Internet data dedicated channel" is introduced in the planning of free-trade zones (as well as other industrial zones) as a unique connection between industrial parks housing export-oriented businesses and the international gateways located in Beijing, Shanghai, and China.[147]

### 3. Zoning as an Infrastructural Choice

Article 6 in Provisions on Promoting and Regulating the Cross-Border Flow of Data opens up opportunities to all free trade zones to reduce the cost of data outbound compliance. Having analyzed both the international and domestic data outbound infrastructure, we can now turn to the original question: To what extent these pilot zones could mitigate the regulatory side-effects of the Troika Law on digital trade? Additionally, is there any possibility for pilot zone policies to further scale-up nationwide?

*(a) Established cluster with global telecommunication infrastructures* Up until now, Shanghai free trade zone appears to be the most promising model and it is highly probable that this will remain in the near-term future. Shanghai exemplifies the characteristics of an established cluster, which are areas that have been conducive to business for a long time and have an abundance of infrastructures (such as transportation, energy systems, and manufacturing). Since its creation in 2013, it has been twice enlarged, proving to be a robust cluster. Government service, financial sector reform, service opening up, trade facilitation through the Single Window approach, FDI management reform highlighted by Negative List, and pre-establishment treatment were among the regulatory innovations developed and tested in Shanghai free trade zone, with fairly good results.

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[145] Tianpu Yang et al., *Research on the Development Route of International Communication Accesses* in CYBER SECURITY: 17TH CHINA ANNUAL CONFERENCE (CNCERT 2020) 16, 24 (Wei Lu et al. eds., 2020), https://doi.org/10.1007/978-981-33-4922-3_2.

[146] CHINA ACAD. INFO. & COMMC'N TECH., SHANTOU QUYUXING GUOJI TONGXIN YEWU CHURUKOUJU CHANYE FAZHAN HE ZHENGCE CHUANGXIN GUIHUA (汕头区域性国际通信业务出入口局产业发展和政策创新规划) [DEVELOPMENT AND POLICY INNOVATION PLAN FOR THE SHANTOU REGIONAL INTERNATIONAL COMMUNICATION BUSINESS GATEWAY] 24-25 (Aug. 2022), https://www.shantou.gov.cn/attachment/0/69/69984/2204473.pdf [https://perma.cc/8LUW-JWM7].

[147] Chen Biji (陈碧琪), *Hainan Zimaogang Guoji Hulianwang Shuju Zhuanyong Tongdao Niandi Jiancheng Touyong* (海南自贸港国际互联网数据专用通道年底建成投用) [*The Dedicated International Internet Data Channel for the Hainan Free Trade Port Will Be Completed and Operational by the End of the Year*], XINHUA SILU (新华丝路) [XINHUA SILK ROAD] (Aug. 3, 2020), https://www.yidaiyilu.gov.cn/p/140811.html [https://perma.cc/G5AZ-L9WK].

Advantages *of existing clusters* have high chances of being carried over to data outbound policies if these clusters are at the same time *equipped with global telecommunication infrastructures*, or is *geographically close* to them. As indicated before Shanghai hosts all the relevant data outbound infrastructures. This city is one of three in China that serve as international gateways, and has submarine cable landing stations that are linked to Intra-Asia, Europe, Asia-Europe-Middle East and Asia-North America traffics (see above Table 2). The existing businesses in Shanghai's clusters can foster the formation of new digital businesses and develop a symbiotic relationship between businesses and infrastructures that allows for long-term commercial success. These factors then form positive feedbacks both economically and socially, which provides further opportunities to deepen opening-up efforts and test regulatory innovations.

Guangdong province is a similar example. Its history with war and trade, as well as being one of four special economic zones in 1979 for China's economic opening up, has fostered the formation of several clusters in the province. The data outbound infrastructures in Guangdong province are located respectively in Guangzhou (international gateways) and Shantou (submarine cable landing stations). The future of data outbound policies is likely promising in Guangdong province because its businesses and infrastructures are geographically more diffused than Shanghai and might present in different forms.

(*b) Established cluster with regulatory and/or infrastructural integration* Geographical distance may be remedied using infrastructure and regulatory tools. The Greater Bay Area is a relevant example. While cities like Guangzhou and Hong Kong are both clusters and hosts for global telecommunication infrastructures, the surrounding cities in the Greater Bay Area may gain from the spillover effects. Data piloting policies may be effective in these areas with *policy and infrastructure integration* to increase inter-region connectedness and amplify the spillover effects.[148] For example, in an opinion issued by Guangdong government in November 2023, it says:

> "Leverage the institutional and resource advantages of Hong Kong and Macau, establish a system of data flow rules and operational mechanisms within the bay area, rely on the advantages of key institutions in the bay area to integrate resources, and cooperatively build, share, manage, and operate a trusted data circulation infrastructure, providing services such as storage, sharing, and trading for compliant and effective data circulation."[149]

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[148] Delgado, Porter and Stern find that clusters that are co-located in nearby regions benefit from inter-regional spillovers. Mercedes Delgado et al, *Clusters, Convergence, and Economic Performance* 11-12 (Nat'l Bureau of Econ. Rsch., Working Paper No. 18250, 2012), http://www.nber.org/papers/w18250.

[149] *Shujutequ Yaolaile, Dawanqu Shuju Kuajing Liutong Zaijiasu* ("数据特区"要来了，大湾区数据跨境流通再加速) *["Data Special Zone" is Coming: Cross-Border Data Flow in the Greater Bay Area to Accelerate Again*], YUE GANG AO DAWANQU MENHU WANG (粤港澳大湾区门户网) [GUANGDONG-HONG KONG-MACAO GREATER BAY AREA] (Nov. 14, 2023), https://www.cnbayarea.org.cn/news/special/platform/content/post_1140487.html [https://perma.cc/J26Q-XGAH].

Many landlocked zones, especially those with existing clusters, fall into this category. Their infrastructure development focuses on enhancing land communication connectivity, cross-border transportation, and regional international cross-border agreements (ICBAs).[150]

*(c) pure infrastructural and regulatory support without existing clusters or seeds* The challenging and uncommon situation arises when there is an absence of existing clusters or even the seeds of a cluster. A notable and unique example is Hainan, which began its development in the 1980s and is located at the southernmost tip of China. Despite its well-established tourism industry, Hainan did not seem to have a pre-existing cluster focused on export-oriented trade and businesses.[151] This stands in contrast to the views of cluster theory scholars like Michael Porter, who argued that "[t]here should be some seeds of a cluster that have passed a market test before cluster development efforts are justified."[152]

The development of Hainan free trade port exemplifies what is often called "infrastructural developmentalism."[153] The designation of Hainan as a free trade port was largely influenced by its strategic location in Southeast Asia. The strategy involves linking Hainan with Hong Kong and the Greater Bay Area to forge a regional economic hub, strengthening connections with the ASEAN-led RCEP countries. [154] The plan for Hainan is ambitious. It involves implementing favorable regulations akin to those in successful global free trade ports such as Singapore, Hong Kong, and Dubai to attract foreign investment and global businesses.[155] Moreover, both central and local governments have emphasized infrastructure construction through an integrated strategy. For instance, the Ministry of Industry and Information Technology (MIIT) and the Cyberspace Administration of China (CAC) have made significant efforts to expedite the construction of the Hainan to Hong Kong Express (H2HE), which was completed in June 2021 and connects Hainan,

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[150] *Zhongxin (Chongqing) Guoji Hulianwang Shuju Zhuanyong Tongdao Kaitong* (中新（重庆）国际互联网数据专用通道开通) [*China-Singapore (Chongqing) Dedicated International Internet Data Channel Launched*], CHONGQING RIBAO (重庆日报) [CHONGQING DAILY], Sept. 17, 2019, http://m.xinhuanet.com /cq/2019-09/17/c_1125003628.htm [https://perma.cc/3WKM-J43F].

[151] *See generally* Wenjiao Cao, *A New Stage of Legislative Experimentation of China in Hainan*, 13 TSINGHUA CHINA L. REV. 363 (2021).

[152] Michael Porter, *Location, Competition, and Economic Development: Local Clusters in a Global Economy*, 14 ECON. DEV. Q. 15, 26-28 (2000).

[153] *See, e.g.,* Bilge Firat, *"The most eastern of the West, the most western of the East": Energy-transport infrastructures and regional politics of the periphery in Turkey*, 3 ECON. ANTHROPOLOGY 81, 82-84 (2016) (discussing how regional development was achieved through energy-transport infrastructures in the history of European integration) https://doi.org/10.1002/sea2.12046.

[154] Seong Hyeon Choi & Luna Sun, *How will China's Hainan free-trade port affect the Greater Bay Area and Asean?*, S. CHINA MORNING POST, Apr. 8, 2023, https://www.scmp.com/economy/china-economy/article/3216325/how-will-chinas-hainan-free-trade-port-affect-greater-bay-area-and-asean; *Three years on, Hainan Free Trade Port builds up global influence*, XINHUA, June 1, 2023, https://eng.yidaiyilu.gov.cn/p/321739.html [https://perma.cc/3DLY-52M7].

[155] *See generally* Wenfeng Wei, *Understanding Hainan Free Trade Port: China's Efforts to Explore High-level Opening-up*, 12 WORLD ECON. BRIEF 1 (2022), http://dx.doi.org/10.2139/ssrn.4378998.

Guangdong, and Hong Kong. This infrastructure development is strategically aimed at channeling business flows to the area. [156]

This approach involves significant investment in infrastructure and requires substantial regulatory authority to ensure the sustained effort. The Hainan Free Trade Port Law is the first and so far, the only national legislation specifically crafted and enacted to support the development of a free trade port.

This section outlines three typical scenarios for forecasting the real impact of data outbound policies in pilot zones and potential scenarios for scaling-up. One critical factor is the presence of an established cluster or at least the seeds of future clusters, which underpin economies of agglomeration. Another crucial factor is connectivity to global telecommunication infrastructures. Although some studies highlight the risks of "straw effects," where improved economic activities migrate to more developed locations through new infrastructure, much like juice being sucked up through a straw,[157] it is generally believed that enhanced ICT infrastructures do not cause a straw effect but rather help reduce geographical disparities.[158]

## V. CONCLUSION

In the coming years, China will likely double down on its unique zoning efforts to counterbalance the side effects of security-based data outbound restrictions, fully aware of the economic and political importance of smoothing outbound data flow. The piloting process for data outbound regulation in free trade zones is characterized by intricate interactions between central and local governments, with stakeholder enterprises and industry associations as active interest groups exerting substantial influence.[159] These zones serve as buffers where economic interests are pursued.

During the 2023 two sessions, the National Data Administration (NDA) was founded under the NDRC. Taking over many responsibilities from the CAC, the NDA now spearheads China's digital development efforts.[160] While there are still risks associated with the fast-changing regulatory environment in tech sectors like dancing on a high wire due,[161] this institutional reform may help prevent data

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[156] Hainan Ziyou Maoyigang Jianshe Baipishu (海南自由贸易港建设白皮书（2021）) [Hainan Free Trade Port Construction White Paper (2021)], (promulgated by Hainan Provincial Comm. Chinese Communist Party Free Trade Port Working Comm. office, June 20, 2021).

[157] Kristian Behrens et al., *Changes in Transport and Non-Transport Costs: Local vs Global Impacts in a Spatial Network*, 37 REG'L SCI. & URB. ECON. 625, 640 (2007) (explaining straw effect in the context of transportation infrastructure), https://doi.org/10.1016/j.regsciurbeco.2007.08.003.

[158] Vivien Foster et al., *Improving data infrastructure helps ensure equitable access for poor people in poor countries*, WORLD BANK BLOGS (May 6, 2021), https://blogs.worldbank.org/en/opendata/improving-data-infrastructure-helps-ensure-equitable-access-poor-people-poor-countries [https://perma.cc/NF4P-L4FC].

[159] *See, e.g.,* Fengan Jiang, *China's Legal Efforts to Facilitate Cross-border Data Transfers: A Comprehensive Reality Check*, 32 ASIA PAC. L. REV. 81, 89-90 (2024) (showcasing how companies got involved in piloting with local regulators), https://doi.org/10.1080/10192557.2023.2232613.

[160] *China to Establish National Data Bureau*, XINHUA, Mar. 7, 2023, https://english.www.gov.cn/news/topnews/202303/07/content_WS640701c0c6d0a757729e7d87.html [https://perma.cc/QD8E-AHPY].

[161] *See generally* ANGELA HUYUE ZHANG, HIGH WIRE: HOW CHINA REGULATES BIG TECH AND GOVERNS ITS ECONOMY (2024); XUEGUANG ZHOU, THE LOGIC OF GOVERNANCE IN CHINA: AN ORGANIZATIONAL

policies from being diluted or misdelivered during enforcement by multi-agencies with different priorities. This is crucial given the highly fragmented nature of authority in data regulation. Moving forward, the NDA, rather than the CAC, will supervise the detailed progress of cross-border data flow pilots in free trade zones.

However, this is not to imply that security concerns have diminished. China will facilitate outbound data flow, but in a structured and "ordered (有序) " manner.[162] Piloting data outbound regulation in free trade zones makes this balancing effort more conceivable and feasible. Through legal and infrastructural arrangements, ongoing data piloting has the potential to continue channeling China's data outbound activities into specific areas, increasing their visibility and making them more amenable to regulation, and foster local and national economies.

APPROACH (2022); MAO'S INVISIBLE HAND: THE POLITICAL FOUNDATIONS OF ADAPTIVE GOVERNANCE IN CHINA (Sebastian Heilmann & Elizabeth J. Perry eds., 2011).

[162] *See generally* Shuju Kuajing Liudong de Zhongguo Fangan (数据跨境流动的中国方案) [China's Solution for Cross-Border Data Flow], 5 ZHONGGUO WANGXIN (中国网信) [CHINA CYBERSPACE] (2024), https://mp.weixin.qq.com/s/ZjBWLWXn26JMMuV6u-aiNQ [https://perma.cc/RMJ4-J5PJ].