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**Data is Different: Why the World Needs a New Approach to
Governing Cross-border Data Flows**

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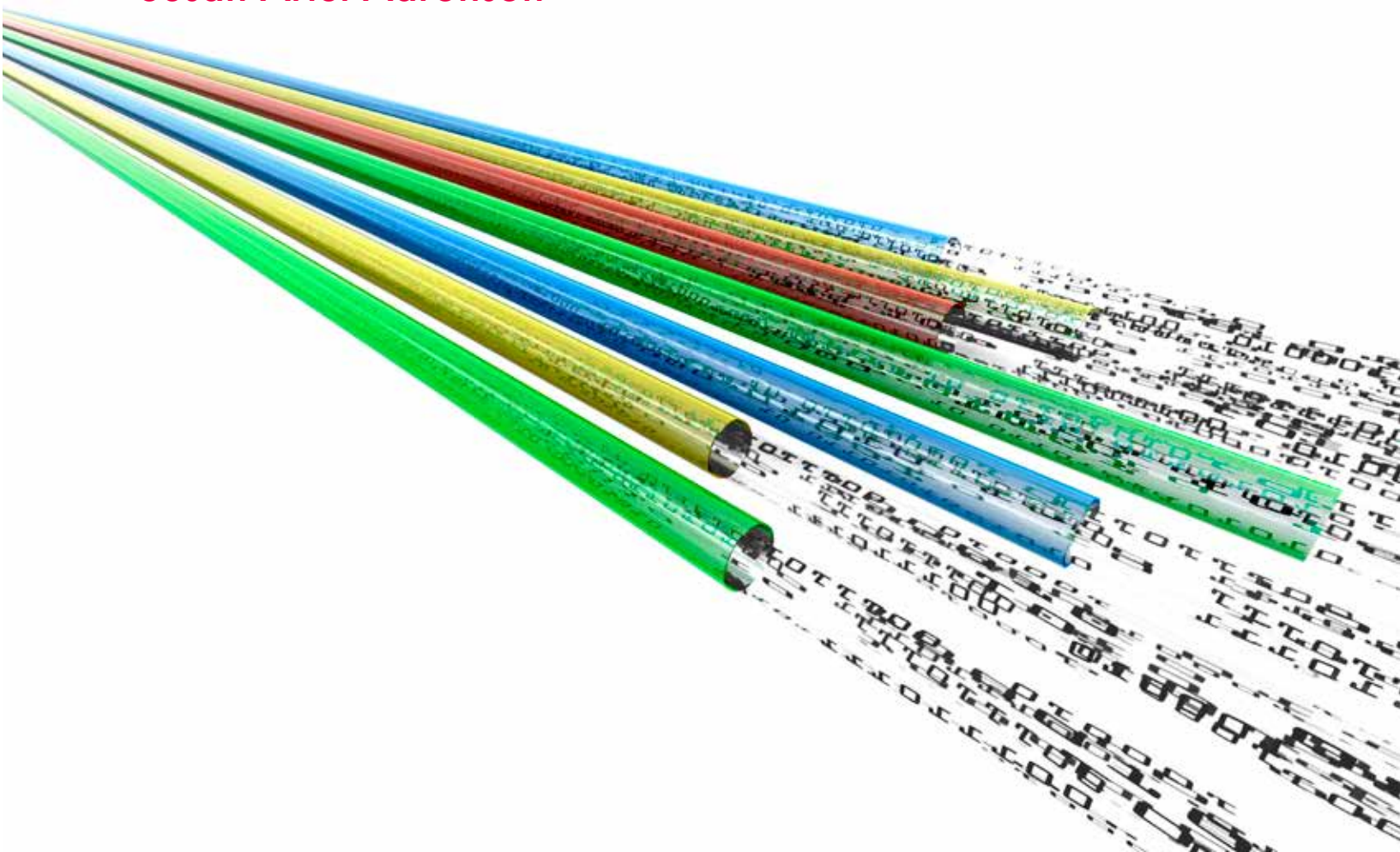
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Table of Contents

vi	About the Author
vii	About the Global Economy Program
vii	Acronyms and Abbreviations
1	Executive Summary
2	Introduction
4	The Peculiarities of Data and the Role of Data in Trade
5	New Uses for Data Require New Ways of Thinking about Data
7	The Current State of Rules Governing Cross-border Data and the Rise of Data Realms
12	A Path Forward
16	Conclusion
18	Appendix
21	Works Cited
26	About CIGI
26	À propos du CIGI

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Susan is the author of six books and numerous articles. Her work has been funded by major international foundations including the MacArthur Foundation, the Ford Foundation and the Rockefeller Foundation; governments such as the Netherlands, United States and Canada; the United Nations, International Labour Organization and the World Bank; and US corporations including Google, Ford Motor Company and Levi Strauss & Co. Susan is also a frequent speaker on public understanding of globalization issues and international economic developments. She has often provided background and commentary on *Marketplace* radio and was a monthly commentator on *All Things Considered* and *Morning Edition*. Susan has appeared on CNN, CBC, the BBC and NPR to discuss trade and globalization issues. From 1995 to 1999, she was a guest scholar in economics at the Brookings Institution, and from 2008 to 2012 she was a research fellow at the World Trade Institute. In her spare time, Susan enjoys triathlons and ballet.

About the Global Economy Program

Addressing limitations in the ways nations tackle shared economic challenges, the Global Economy Program at CIGI strives to inform and guide policy debates through world-leading research and sustained stakeholder engagement.

With experts from academia, national agencies, international institutions and the private sector, the Global Economy Program supports research in the following areas: management of severe sovereign debt crises; central banking and international financial regulation; China's role in the global economy; governance and policies of the Bretton Woods institutions; the Group of Twenty; global, plurilateral and regional trade agreements; and financing sustainable development. Each year, the Global Economy Program hosts, co-hosts and participates in many events worldwide, working with trusted international partners, which allows the program to disseminate policy recommendations to an international audience of policy makers.

Through its research, collaboration and publications, the Global Economy Program informs decision makers, fosters dialogue and debate on policy-relevant ideas and strengthens multilateral responses to the most pressing international governance issues.

Acronyms and Abbreviations

AI	artificial intelligence
APEC	Asia-Pacific Economic Co-operation
CPTPP	Comprehensive and Progressive Agreement for Trans-Pacific Partnership
FTAs	free trade agreements
GATS	General Agreement on Trade in Services
GDPR	General Data Protection Regulation
NIST	National Institute of Standards
OECD	Organisation for Economic Co-operation and Development
IoT	Internet of Things
RCEP	Regional Comprehensive Economic Partnership
UNCTAD	United Nations Conference on Trade and Development
USMCA	United States-Mexico-Canada Agreement
WTO	World Trade Organization

Executive Summary

Companies, governments and individuals are using data to create new services such as apps, artificial intelligence (AI) and the Internet of Things (IoT). These data-driven services rely on large pools of data and a relatively unhindered flow of data across borders (few market access or governance barriers). The current approach to governing cross-border data flows through trade agreements has not led to binding, universal or interoperable rules governing the use of data.

Trade diplomats first established principles to govern cross-border data flows, and then drafted e-commerce language in free trade agreements (FTAs), rather than through the World Trade Organization (WTO), the most international trade agreement. Data-driven services will require a different domestic and international regulatory environment than that developed to facilitate e-commerce. Most countries with significant data-driven firms are in the process of debating how to regulate these services and the data that underpins them. But many developing countries are not able

to participate in that debate. Policy makers must devise a more effective approach to regulating trade in data for four reasons: the unique nature of data as an item exchanged across borders; the sheer volume of data exchanged; the fact that much of the data exchanged across borders is personal data; and the fact that although data could be a significant source of growth, many developing countries are unprepared to participate in this new data-driven economy and to build new data-driven services.

This paper begins with an overview and then describes how trade in data is different from trade in goods or services. It then examines analogies used to describe data as an input, which can help us understand how data could be regulated. Next, the paper discusses how trade policy makers are regulating trade in data and how these efforts have created a patchwork. Finally, it suggests an alternative approach.

Five Steps to Help Policy Makers Prepare to Build Rules to Govern Cross-border Data Flows

- 1** **At the national level, policy makers should:**
Create a national data strategy that delineates how public and personal data will be governed.
- 2** **At the international level, policy makers should:**
Collaborate on an interoperable strategy that gives people greater voice and control over their data.
- 3** **At the international level, policy makers should:**
Collaborate to clarify the rules at the WTO governing cross-border data flows and the exceptions to the rules so that nations do not restrict cross-border flows more frequently or broadly.
- 4** **At the international level, policy makers should:**
Find common ground at the WTO on what types of practices should be banned because they are trade distorting.
- 5** **At the international level, policy makers should:**
Delineate how nations should or should not respond to state actions that distort cross-border data flows.

Introduction

The founders of Stitch Fix (a clothing subscription service) and Strava (a social fitness network) understood something basic about people. Humans like to use data to connect with other people and to compare themselves to their peers. Based on those insights, these entrepreneurs were able to build two new digital service firms.

Both Stitch Fix and Strava rely on personal data and AI to serve their customers. Stitch Fix uses AI to find clothes and provide style recommendations to its customers.¹ Runners, cyclists and triathletes turn to Strava to measure their performance and instantly compare it to others around the world.²

The two companies could not succeed without the relatively free flow of data across borders. Data flows move across borders when individuals, companies or governments authorize data to be transferred from one country (the source of data) to another country where the data may be processed or used (United States International Trade Commission 2013, 2014; Nicholson and Noonan 2014).

Firms have long relied on data to improve the efficiency and quality of goods and services. However, today market actors also utilize data to create entirely new services such as personalized health care as well as brand new services such as Strava and Stitch Fix. These sectors are the foundation of the data-driven economy: an economy built around the collection, preservation, protection, implementation and understanding of many different types of data. While the data-driven economy relies on different sources of data, such as satellite data for mapping, public data and proprietary data, much of the data used by these firms is personal data by and about people (World Economic Forum 2011; Ciuriak 2018a).

The data-driven economy portends major changes for the ability of individuals to shape their destiny (autonomy). Computers and robots can perform a wide range of cognitive and manual tasks. Workers with manual dexterity may struggle to find work in an economy that demands complex problem-solving skills, while workers with AI skills may experience high pay and demand (Organisation for Economic Co-operation and Development [OECD] 2015; Columbus 2018). As noted above, firms active in the data-driven economy are dependent on data, much of which is personal data. According to the US National Institute of Standards (NIST), personal data used to be something that researchers had to ask for, store and analyze. Because it was not easy to collect personal data, scholars struggled to get sufficient information. Today, almost all our daily activities are data collection opportunities, thanks to the mobile internet, the IoT and other data-driven technologies (NIST 2018).

In the past, people could control their data to some extent, because researchers had to obtain (or at least go through the motions of obtaining) consent. However, most people have not given informed consent for the use and sale of their data online. These web users do not understand that many online free services are not really free. They get these services in return for providing data that firms then monetize or utilize (Australian Government Productivity Commission 2017). Hence, while the mission of data-driven firms such as Stitch Fix and Strava may be to help their customers, their strategy for doing so may conflict with long-accepted ideas about their customers' autonomy — the ability of each individual to determine their own destiny (König 2017; Childress 1990).

Stitch Fix and Strava are small players in the data-driven economy, but they are not atypical. Many of these firms see providing data services as akin to providing a public good. For example, Google's corporate mission is "to organize the world's information and make it universally accessible and useful."³ Many of the new data-driven services have been made possible through cloud computing (computing as a service). According to the research firm Gartner, the worldwide public cloud services market is projected to grow to US\$186.4 billion in 2018, up from US\$153.5 billion in 2017.⁴

1 Stitch Fix's founder, Katrina Lake, recognized that people want to look good, but may not know what clothes look best on them, or may dislike shopping. See www.stitchfix.com/about and <https://support.stitchfix.com/hc/en-us/articles/204222994-What-is-Stitch-Fix-How-Does-it-Work-FAQ>.

2 Michael Horvath and Mark Gainey, the founders of Strava (Swedish for strive), recognized that athletes did better at pushing themselves when they thought other people were watching (whether in person or online) (the Hawthorne effect). On Strava, see www.strava.com/features, and on its use of AI, see <https://strive.ai/>. On the Hawthorne effect, see *The Economist* (2008).

3 See www.google.com/about/.

4 See www.selectusa.gov/software-and-information-technology-services-industry-united-states.

Not surprisingly, researchers and policy makers now believe that data is the most traded good or service. In 2016, the McKinsey Global Institute asserted that the value of data flows has overtaken the value of global trade in physical goods (Bughin 2016). According to the World Economic Forum, “the world produces 2.5 quintillion bytes a day, and 90% of all data has been produced in just the last two years” (Thirani and Gupta 2017).

To succeed in the data-driven economy, companies and researchers need access to significant amounts of data (what economists term economies of scale). Policy makers in many countries want to encourage these scale economies with shared norms and rules, but they also want these shared norms and rules to explicitly limit trade in some types of data to ensure the safety and privacy of their citizens (the exceptions). In establishing these norms and rules, decision makers must develop a process that reassures their citizens that the rules-based system is transparent, accountable and open to citizen input (Aaronson 2016). With shared norms and rules, the internet would be less likely to fragment, more people would have greater access to information and individuals could create and share more information (ibid.). Individuals might also be better able to obtain rents from their personal data and have some modicum of control over its use. However, citizens and policy makers around the world disagree on how and where to develop such shared rules (Castro and Atkinson 2014, 2; World Bank 2016).

Many executives and policy makers argue that trade agreements are the appropriate venue in which to govern cross-border data flows, saying that when information flows cross borders, they are essentially traded (Aaronson 2016; Meltzer 2013). Not surprisingly, policy makers from some countries have negotiated e-commerce and digital trade chapters in FTAs. This paper distinguishes between e-commerce (goods and services delivered via the internet and associated with a transaction) and digital trade, which includes e-commerce as well as new data-based services such as Stitch Fix

or social platforms such as Twitter.⁵ While countries have begun to build a regulatory environment for e-commerce, it is unclear how to build an effective enabling environment for data. Many developing countries are not yet ready for such rule making. After all, the bulk of firms like Strava and Stitch Fix are being created in middle income and wealthy countries (WTO 2018). In many developing countries, business people are hobbled by obstacles such as unstable internet connections, limited funding, inadequate numbers of researchers and a lack of complementary policies and infrastructure (Onifade 2018; Golobski 2018). Moreover, while many countries have open data strategies for government-funded or public data, most countries have not yet figured out how to ensure that when data is mined, personal data is protected, and firms do not exploit personal data, leading to problems such as identity theft, manipulative marketing or discrimination (United Nations Conference on Trade and Development [UNCTAD] 2018). The future of the internet is in developing countries; the citizens in these countries deserve a chance to shape new rules and to influence how firms use data (Aaronson and Leblond 2018.)

This paper examines the new role of data in trade and describes why data in trade is different from trade in goods and services. This paper focuses on two categories of data: public data (data in the public domain and data held by government) and personal data. It then examines several analogies analysts use to describe data as an input, which can help us understand how data could be regulated. Next, the paper discusses how trade policy makers are regulating trade in data and how these efforts have created a patchwork of rules. Finally, it suggests an alternative approach. Before trade negotiators try to develop rules regarding cross-border data flows, they must acknowledge the special character of data. Policy makers should focus first on creating an effective enabling environment for data, then build trust

5 According to the OECD, digital trade can be defined as all cross-border trade transactions that are either digitally ordered, facilitated or delivered (OECD and International Monetary Fund 2017, 4). The United States defines digital trade as goods and services delivered via the internet and/or associated technologies (Fefer, Akhtar and Morrison 2017). The Government of Australia notes “electronic commerce (e-commerce) and digital trade refer to the trade of goods and services using the internet including the transmission of information and data across borders (see <https://dfat.gov.au/trade/services-and-digital-trade/Pages/e-commerce-and-digital-trade.aspx>). An official Canadian definition could not be found, but Canada used the term digital trade in its most recent WTO reform proposals. See <https://drive.google.com/file/d/13ZrG6E0mwxtZ1xyaPWpZcT-KKjhwyUe/view>.

in that new economy by empowering people around the world to control their data. As the Australian government noted, the lack of trust by both data custodians and users is choking the use and value of data (Australian Government Productivity Commission 2017, 2). Given the rising influence of data-driven services and firms, such an agreement must be built by and for the people whose data serve as its foundation.

The Peculiarities of Data and the Role of Data in Trade

Data and information have long been a key component of trade but, as noted above, data has created new forms of trade. However, cross-border data flows are quite different from trade in goods or other types of services. First, many services, from payroll to data analytics, rely on access to cross-border data flows. These data flows may yield a good, a service or both (Ariu 2012). Moreover, trade in digital services differs from trade in other services because suppliers and consumers do not need to be in the same physical location for a transaction to occur. Second, trade in data is fluid and frequent, and location is hard to determine on the borderless network. Trade in the same set of data can occur repeatedly in nanoseconds (for example, when millions of people simultaneously download Beyoncé’s latest song). As a result, researchers and policy makers may find it hard to determine what is an import or export. They also struggle to ascertain when data is subject to domestic law (such as intellectual property law) and what type of transborder enforcement is appropriate (Goldman 2011; de la Chapelle and Fehlinger 2016). Third, economists generally agree that many types of data are public goods, which governments should provide and regulate effectively. Furthermore, when states restrict the free flow of data, they reduce access to information, which, in turn, can diminish economic growth, productivity and innovation domestically and globally (Maskus and Reichman 2004, 284-85; Khan 2009; OECD 2016). They can also affect the functioning of the internet (Force-Hill 2014, 32). Fourth, trade in data occurs on a shared platform

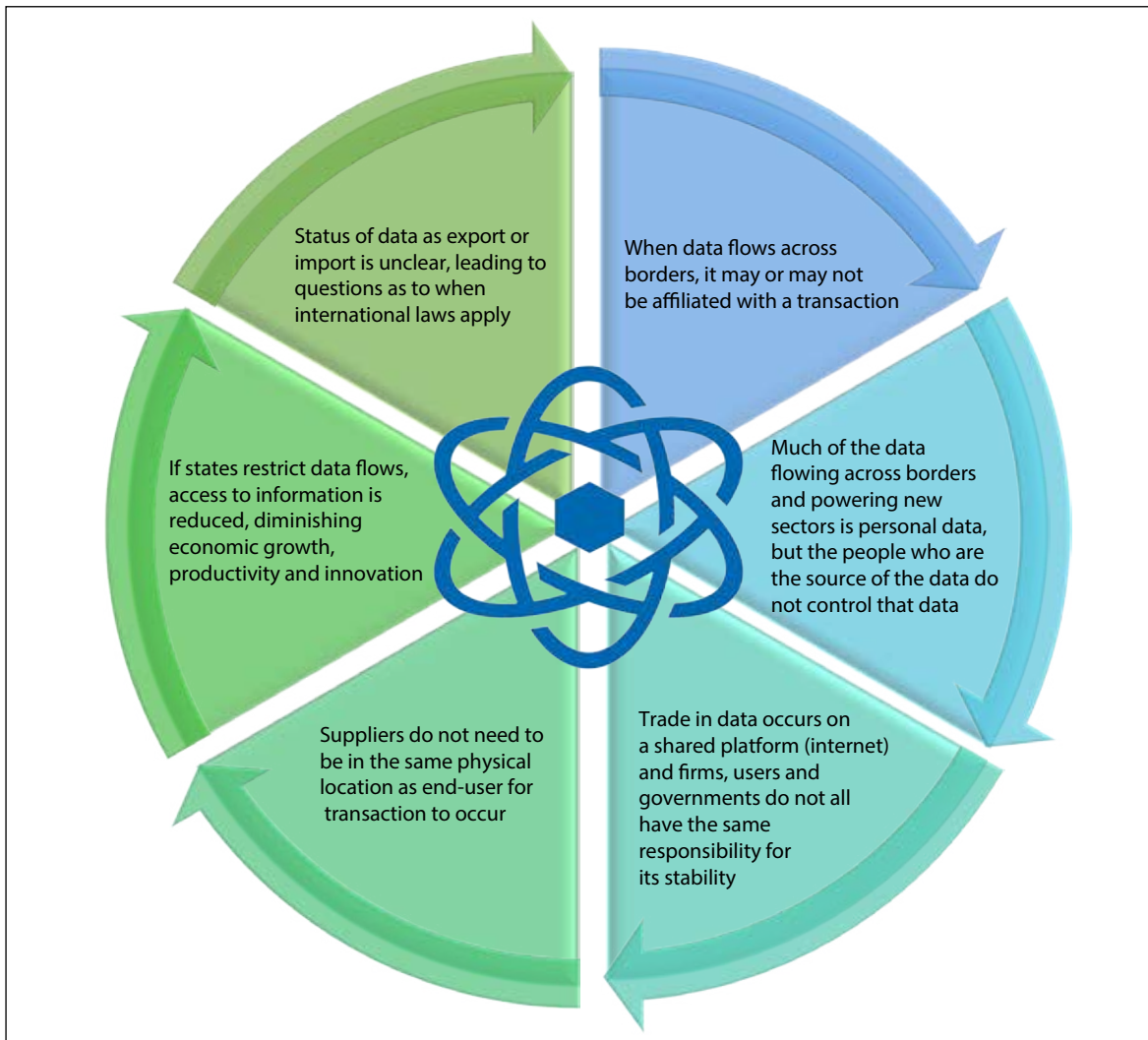
(the internet) held in common; firms, users and governments do not all have the same responsibility for its stability. Fifth, much of the data flowing across borders and powering new sectors is personal data — digital data created by and about people. While they may benefit from services built on that data, the people who are the source of that data do not control it. It is their asset, yet they cannot manage, control, exchange and account for it (World Economic Forum 2011, 11). Sixth, the US Department of Commerce found that three of the four types of data flows are not affiliated with a transaction; hence, it is hard to describe some of these flows as “traded”⁶ (Nicholson and Noonan 2014; US Department of Commerce 2016, 3). Figure 1 summarizes these six attributes.

In sum, cross-border data flows moving across borders may not fit the traditional definition of trade. Moreover, trade in data is very different from trade in other goods and services. Recent survey data shows that people around the world are increasingly concerned about how firms use, protect, control and trade personal data. For example, the US government found that Americans are increasingly concerned about online security and privacy after recent data breaches, cybersecurity incidents and controversies over the privacy of online services (Goldberg 2016). A 2016 Eurobarometer survey found that 90 percent of respondents say it is important that personal information (pictures, contact lists, and so on) on their computer, smartphone or tablet can only be accessed with their permission. Eighty-two percent of those polled also say it is important that tools for monitoring their activities online (such as cookies) can only be used with their permission.⁷ A 2018 poll of 25,262 internet users in 25 countries found that half of internet users surveyed around the world are more concerned about their online privacy than they were a year ago, reflecting

6 The US Department of Commerce (2016, 3) has divided cross-border data flows into four types based on the type of transaction affiliated with it: purely non-commercial data traffic, including government and military communications; transaction data flows between buyers and sellers at a market price, including direct purchases between buyers and sellers, such as in online banking or advertising, and services transactions that involve digital platforms acting as intermediaries between buyers and sellers; commercial data and services exchanged between or within businesses or other related parties at \$0 market price, including supply chain, personnel or design information; and digital data and services delivered to and from end-users at \$0 market price, including free email, search engine results, maps and directions, and information via social media.

7 See <http://ec.europa.eu/COMMFrontOffice/publicopinion/index.cfm/Survey/getSurveyDetail/instruments/FLASH/surveyKy/2124>.

Figure 1: Cross-border Data Flows Are Different from Trade in Goods or Other Types of Services



Note: Figure prepared by Kailee Hilt.

growing concern about online privacy and the power of social media platforms (CIGI 2018). Hence, policy makers should at least question whether the traditional model of trade rules needs reform to accommodate these concerns related to cross-border data flows. Citizens want their governments to strengthen data protection laws, and to beef up enforcement.⁸ In 2017, the Australian government stated that “governments that ignore potential gains through consumer data rights will make the task of garnering social license needed for other data reforms more difficult” (Australian Government Productivity Commission 2017, 2).

⁸ For a good overview, see DLA Piper, “Data protection laws of the world,” www.dlapiperdataprotection.com.

New Uses for Data Require New Ways of Thinking about Data

When individuals try to describe how data is reordering markets, they often compare data to other long-standing inputs to the provision of goods and services. In so doing, they hope to create greater understanding of the import and value of data. As an example, the World Economic Forum (and others) describes data as the oxygen of digital life (Sönmez 2018; Governance Now 2017).

In contrast, *The Economist* describes data as a new type of raw material on par with capital and labour (*The Economist* 2010). Describing data as a resource allows one to compare data mining to the mining of oil or other resources. However, law professor Lauren Scholz notes this analogy is not helpful because the supply of oil is limited and only one actor can use a given portion of oil at one time. On the other hand, if you have access to data, you can use it to create information and value (Scholz 2018).

Other analysts describe data as a form of capital that can be shared and leveraged within and between organizations (*MIT Technology Review* 2016; Sadowski 2016). They note that data capitalists such as Google, Facebook, Amazon, Uber, Stitch Fix and Strava commodify and monetize data, creating new revenues and/or functions for the company (Sadowski 2016; World Economic Forum 2011; *MIT Technology Review* 2016).

Still other scholars posit that we should think about data as labour, as in the early phases of the Industrial Revolution. We provide our data for free to firms that turn around and monetize this information. But you and I, like the workers of yore, lack bargaining power, and are unable to meaningfully negotiate over payments for our data. Most of us are not sufficiently protected from misuse of our personal data or violations of our privacy. In this way, we are denied a share in the economic value of our data, just as workers in the early industrial age. We are facilitating a massive transfer of wealth from ordinary people to the tech titans (Posner 2018). In search of evidence, two scholars traced the AI supply chain and found invisible, hidden labour, outsourced or crowdsourced, hidden behind interfaces and camouflaged within algorithmic processes and used to feed neural networks. They note: “Sometimes this labor is entirely unpaid, as in the case of the Google’s reCAPTCHA. In a paradox that many of us have experienced, to prove that you are not an artificial agent, you are forced to train Google’s image recognition AI system for free, by selecting multiple boxes that contain street numbers, or cars, or houses” (Crawford and Joler 2018, section XVIII).

Moreover, these scholars note that treating data like capital exacerbates inequality and limits the productivity gains from big data and AI. They suggest that we should organize collectively to form a “data labor union that would collectively bargain” for fees for assessing our data (Ibarra et al. 2018, 4). The union could certify data

quality and guide “users to develop their earning potential” (ibid.). Meanwhile, data collectors “must allow users to understand, withdraw, and transfer their data across competitors” (ibid.). Only by organizing collectively, they assert, can we control how our data is used.

Still other scholars argue that personal data is a form of property and individuals can assert rights to its control and access (Scassa 2018; Breznitz 2018). This notion that some types of data are personal property underpins the new European Commission regulation on personal data protection, the General Data Protection Regulation (GDPR). Some countries, such as Brazil, are building on this approach or developing their own new paradigm for enabling individuals to control their data (Ramey 2018).

If regulators view data as a form of property, corporations would have to pay for permission, pay to collect and use data, and no longer offer services for free. Moreover, according to Dan Breznitz (2018), if firms are required to pay to use personal data, they would have an incentive to keep data accurate and carefully stored. But law professor Lisa Austin (2018) warns “ownership language portrays data like a natural resource...and economic prosperity requires its extraction and processing. Within this framework, privacy becomes a competing claim of control — a kind of ‘ownership’ claim to be carefully balanced against the ownership claims of those doing the extracting and generating economic gains.” Nor can we ensure that our private information is not misused. As law professor Teresa Scassa (2018, 9) has noted, privacy laws are ill fitted to a context in which data is a key economic asset.

Finally, the UK government has introduced the notion that data is a form of infrastructure. In a paper prepared for the National Infrastructure Commission, Peter Kawalek and Ali Bayat (2017, 1) noted “the managed and built environments increasingly depend upon data in real-time.... New mechanisms for the assembly, management and processing of data provide a new impetus for thinking how the data is best managed so that society can best utilize its resources, solve the most problems and provide the most social good for most people.” In this view, government plays an important role providing and regulating data and promoting its sharing and consumption.

These analogies are helpful, but they miss an important aspect of the nature of personal data. It is a by-product of our thinking, actions

and simply living. It is not one thing; thus, we should not simply view it as a resource, or as property, capital, labour or infrastructure.

Moreover, a large amount of the data exchanged across borders is personal data. (However, there are no reliable statistics about the types of data exchanged across borders and what percentage is personal.) People's ability to control their data, like other issues of autonomy, is becoming a civil rights issue (König 2017; Aaronson 2018a). According to Ravi Naik (2017), individuals' rights to data protection "have too often been ignored, and it is taking a groundswell of citizen activism to flip the script and hold power to account by individuals asking for their data and determining its use. We are at a watershed moment of a citizen-led demand for data rights, with the hallmarks of a new civil rights movement enmeshed within it." Some countries, such as Chile, Colombia, Ecuador, Mexico and Turkey are making personal data protection a constitutional right, although they differ as to the efficacy of enforcement (Molina 2018).

These analogies can only go so far in guiding public policy because the new economy is behaving in ways that few of us understand. For example, the market for data is opaque: we really do not know how firms use our data. In these conditions, data holders/gatherers can deny or grant access to data. They do not have to let people know what data they have collected, whether it is accurate, how they use it and if they sell it (Breznitz 2018). In opaque markets, policy makers should develop policies that facilitate transparency and accountability (counterweights to opacity). Hence, Breznitz (2018) argues that governments must establish the market for data and set the rules for how data is gathered and used. Meanwhile, the Australian Government Productivity Commission (2017, 2) says that governments must move markets from a system based on risk aversion and avoidance (which is not working) to one based on transparency and confidence in data processes.

Moreover, policy makers do not know how to go from the current system to one that is trusted, transparent and effective in regulating data flows at the national and international levels. As they attempt to develop a new approach, trade rules will be an important part of their mapping. Except for data as property, these analogies have not significantly influenced national and international regulations.

Despite their flaws, two of these analogies may be useful to trade policy makers as they seek to develop rules governing cross-border exchanges of data. First, at the national level, developing-country policy makers who see data as a form of basic infrastructure could be more willing to establish data plans to manage how firms utilize and monetize their citizens' data and access and use public data. Smart management of all types of data will enable more people to benefit from such data and to create new data-driven services attuned to specific economies and cultures.

Second, in contrast, the data as labour analogy might help trade policy makers as they attempt to bridge national strategies and create international rules governing data. In the late nineteenth century, many industrializing states developed national regulations to improve work conditions and protect workers from the vagaries of globalization. These regulations helped raise wages, which, in turn, led to improvements in labour productivity and greater trade. But not all states adopted such worker protections and trade policy makers feared a race to the bottom among states competing for lower wages and working conditions. The members of the League of Nations established an International Labour Organization with rules that would help them find common ground to improve workplace conditions, facilitate peace and encourage trade (Huberman 2002; International Labour Organization 2014). Netizens may demand a similar organization to encourage cross-border data flows and find common ground among national data approaches.

The Current State of Rules Governing Cross-border Data and the Rise of Data Realms

Policy makers have been trying for years to create global rules to govern cross-border data flows both at the WTO and in bilateral trade agreements. The WTO includes several agreements that address issues affecting data and digital trade. They include the Information Technology Agreement, the Agreement on Trade-Related Aspects of Intellectual

Property Rights and the General Agreement on Trade in Services (GATS). The GATS is the most relevant to the new data-driven services: it has chapters on financial services, telecommunications and computer services. But it predates the invention of the internet and World Wide Web and says nothing explicit about cross-border data flows. Nonetheless, dispute settlement bodies have interpreted the agreement as applying to various computer and telecommunications services.

Academics, business leaders and policy makers from various countries acknowledge that the GATS is technically neutral — it was written to apply to technologies that could change over time. However, some argue that the WTO's rules need both amplification and clarification to apply to new data-driven services such as those provided by Stitch Fix and Strava (Burri 2013; Lee-Makiyama 2011; WTO 2014; Aaronson 2018b). Meanwhile, although member states established a work program on e-commerce (where they agreed to waive customs duties on electronic transmissions, they have not found common ground on new rules to govern e-commerce and on how to update the GATS by creating a new agreement called the Trade in Services Agreement (WTO 2017; Ciobo 2017).

At the Eleventh WTO Ministerial Conference in Buenos Aires in December 2017, Australia, Japan and Singapore, with the support of 67 other WTO members, launched the Joint Statement on Electronic Commerce initiative. They hoped to encourage a consensus on what members should negotiate and how.⁹ To further that effort, countries have issued proposals and background papers. However, many of these members do not clearly distinguish between e-commerce and digital trade.¹⁰ As Figure 2 below illuminates, even these 70 WTO member states are divided. Some African countries want to limit the discussions to that delineated by the WTO's current exploratory work program,¹¹ which has conducted work on e-commerce within various WTO groups, such as its Council for Trade in Services, since 1998.

Meanwhile, other countries want to go further. Some 13 countries/customs territories have published ideas on how to move forward. The European Union and Singapore focused on establishing an enabling environment for e-commerce (and ensuring it would not be taxed), whereas other countries such as Brazil, Costa Rica, Japan, Taiwan and the United States want to distinguish between rules for e-commerce and rules for the new data-driven economy. They recognize that trade in data requires further discussion of the appropriate enabling environment for such flows.¹² The Australian Government summed this up well:

The scope of e-commerce provisions has changed as digital trade has developed rapidly over time. In Australia's older agreements, these commitments generally focused on aspects of each country's domestic regulatory system to ensure that online commerce was not treated any differently to physical commerce. In more modern agreements, Australia seeks commitments that also address a broader range of cross-border issues, such as commitments to allow the flow of data across borders and prohibitions on requirements to store data locally. As FTAs are designed to be in place for long periods of time, Australia seeks rules that are, wherever possible, technology-neutral. This ensures that the provisions are future-proofed and substantive obligations of an FTA remain relevant even while technology evolves. (2018a)

In the absence of significant progress in digital trade negotiations at the WTO, the United States, the European Union, Australia, Canada and other nations have placed language governing cross-border data flows in e-commerce chapters of their FTAs. As the data-driven economy has expanded in importance, the United States, Mexico, Canada, the European Union and Japan have recently renamed these chapters "digital trade chapters."

Only two FTAs, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), and the United States-Mexico-Canada Agreement (USMCA) (the revised North American Free Trade Agreement) include binding and disputable

9 All WTO documents relevant to e-commerce discussions are at www.wto.org/english/tratop_e/ecom_e/ecom_e.htm.

10 See www.wto.org/english/thewto_e/minist_e/mc11_e/sjf_india_pos_paper.pdf.

11 See https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S009-DP.aspx?language=E&CatalogueIdList=240318&CurrentCatalogueIdIndex=0&FullTextHash=371857150&HasEnglishRecord=True&HasFrenchRecord=True&HasSpanishRecord=True.

12 See https://drive.google.com/file/d/1f9WCOfw_Pa_ZLo4j4qsruqzXzNgbMZRI/view.

Figure 2: Proposals for Governing Cross-border Data Reflect Three Positions



Note: Prepared by Kailee Hilt.

language encouraging cross-border data flows.¹³ The CPTPP will likely be the first agreement with such language to go into effect in early 2019, as the legislatures of six nations have already ratified it.

The CPTPP contains an e-commerce chapter, which makes the free flow of data across borders a default, albeit with clear exceptions. The USMCA, the new updated NAFTA among Mexico, Canada and the United States, has similar language on data as the CPTPP, although the USMCA's chapter is called digital trade. Both agreements require signatories to develop some form of online privacy protection, ban server location requirements as a condition of doing business, and forbid nations from requiring the provision of source code as a condition of doing business. Moreover, both of these agreements include exceptions to achieve important domestic policy objectives such as protecting national security, public morals and privacy, as long as policy makers do so in the least trade distorting manner possible¹⁴ (Aaronson 2017, 2018a).

The European Union is also moving closer to binding provisions on data flows, but such language is not embedded in any trade agreement yet in force. After deliberating for months, the European Union announced its approach to digital trade in February 2018. The language begins by stating: "The Parties are committed to ensuring cross-border data flows to facilitate trade in the digital economy" (European Commission 2018c). Personal data protection is at the core of the strategy. In its future trade agreements, the European Union will insist on three pillars: a horizontal clause

covering the free flow of both personal and non-personal data; a ban on data and server localization requirements; and language that safeguards the European Union's right to regulate personal data, including language that the first two pillars cannot be subject to investor-state challenges or included in regulatory dialogues. In so doing, the European Union made it clear that its vision of data protection cannot be challenged as a barrier to trade (European Commission 2018a, 2018b). But the European Union also seemed to recognize that its approach may be out of date and does not address many barriers to digital trade. The language also contains a review provision, which states that the parties will review this language after three years, but can review the list of restrictions at any time (European Commission 2018a, 2018b). This approach seems to build on the notion that data is the property of firms and individuals. However, officials need to establish clear rules regarding who controls that data and how it can be utilized.

The European Union made it clear that it will only sign FTAs that contain language regarding the free flow of data if its FTA partner(s) adequately protects personal data. These nations must go through an opaque process of becoming adequate. Specifically, these states must create independent government data protection agencies, register databases with those agencies and, in some instances, obtain prior approval from the European Commission before personal data processing may begin (US International Trade Administration 2018; European Commission 2018c).¹⁵ This process is both time consuming and expensive, as the European Union's digital trade partners must devote resources to data protection, a difficult choice for nations with

13 See www.mfat.govt.nz/en/trade/free-trade-agreements/free-trade-agreements-concluded-but-not-in-force/cptpp/comprehensive-and-progressive-agreement-for-trans-pacific-partnership-text/.

14 See www.mfat.govt.nz/en/trade/free-trade-agreements/free-trade-agreements-concluded-but-not-in-force/cptpp/comprehensive-and-progressive-agreement-for-trans-pacific-partnership-text/.

15 On adequacy, see http://europa.eu/rapid/press-release_MEMO-18-4503_en.htm.

Figure 3: The European Union's Approach to Digital Trade and Digital Protectionism



Note: Prepared by Kailee Hilt.

limited governance expertise or funds. Figure 3 summarizes the European Union's approach.

While the United States, European Union, Canada, Australia and other nations are using FTAs to expand their access to data, China relies on its huge market. Policy makers in China restrict the free flow of data and information not only across borders but also within China. In so doing, Chinese officials maintain social stability and the power of the Communist Party of China (Aaronson and Leblond 2018). China is participating in the negotiation of the Regional Comprehensive Economic Partnership (RCEP), a mega-regional trade agreement. RCEP includes Australia, India, Japan, South Korea and New Zealand as well as the countries of the Association of Southeast Asian Nations. But the digital trade chapter language of this agreement is unclear (Panday 2017; Australian Government 2017b, 2018b). The negotiations have been conducted in secret and no documents have been released. Member states are supposedly pushing for binding language on the free flow of data, language on

privacy and language banning some forms of digital protectionism. But, given China's determination to control the internet within its borders, it is unclear if China would agree to binding language regarding the free flow of data as a default, privacy and bans on certain types of practices as trade distorting (Asian Trade Centre 2016, 2017).

Thus, the three big digital markets — the United States, the European Union and China — have taken different approaches to cross-border data flows. This patchwork approach is causing another problem for many nations. Nations such as Canada, Mexico and Australia, which have (or seek to build) strong trade relationships with the big three, must choose which approach — the US or the EU or Asia-Pacific Economic Co-operation (APEC) and OECD — to follow (Aaronson and Leblond 2018). Countries that choose more than one such market will face high regulatory costs as their costs of compliance would rise, given different standards (Carson 2014; 2015).

In a recent scholarly study, the WTO secretariat confirmed this patchwork of rules. It examined regional trade agreements that have incorporated specific provisions related to e-commerce. It found significant heterogeneity among the 75 chapters that explicitly address e-commerce. For example, these FTAs have different objectives, scope and definitions. The FTAs also define and limit different barriers to trade and, most importantly, 38 of the 75 chapters have different provisions related to the domestic legal framework in which e-commerce takes place. Finally, 44 of the 75 chapters include language on personal data protection. Here, too, they have very different definitions and obligations (Monteiro and Teh 2017).

Developing countries are likely to have the most problems adapting to the data-driven economy. These countries will be customers rather than producers of AI and other data-driven sectors. According to Kai-Fu Lee (2017), a venture capitalist and former computer scientist, the bulk of profit from the data-driven economy and, in particular, AI will go to the United States and China: “A.I. is an industry in which strength begets strength: The more data you have, the better your product; the better your product, the more data you can collect; the more data you can collect, the more talent you can attract; the more talent you can attract, the better your product. It’s a virtuous circle, and the United States and China have already amassed the talent, market share and data to set it in motion.” He also notes these countries will have growing populations with few future job opportunities without more years of education. Without those workers earning adequate income, states will not be able to raise sufficient revenue to help their workers gain sufficient education (ibid.). In addition, according to economist Dan Ciuriak (2018b, 6), “the national interest...turns on the ability to capture market share...which depends on the ability to capture data.” Developing countries may have little opportunity to capture data and hence to gain comparative advantage in the data-driven economy.

Additionally, many developing countries have not adopted effective rules protecting personal data online. UNCTAD (2018) reports that, based on 2017 data, 57 percent of all countries (107 countries, of which 66 were developing or transition economies) have put in place legislation to secure the protection of data and privacy. In this area, Asia and Africa show a similar level of adoption, with less than 40 percent of countries having a law in place.

Twenty-one percent of countries have no law, 10 percent are in the process of drafting legislation and UNCTAD had no data for 12 percent of the countries reviewed. In general these privacy laws are built on two sets of principles developed at the OECD and at APEC. The OECD Privacy Guidelines, first drafted in 1980, were revised in 2013. The guidelines focus on managing privacy risk and encouraging interoperability among privacy regimes (OECD 2013). Meanwhile, in 2017, the members of APEC set a Privacy Framework: a set of principles and implementation guidelines designed both to establish effective privacy protections that facilitate information flows, and ensure continued trade and economic growth in the APEC region of 27 countries (Consumers International 2018). Unlike the GDPR, which requires other nations to become adequate or devise a commensurate regulatory strategy, these frameworks and guidelines do not displace or change a country’s domestic laws and regulations. Where there are no applicable domestic privacy protection requirements in a country, they provide a floor (ibid.).

Moreover, some countries hoard and refuse to share publicly held data with their citizenry (World Bank 2016, 247; Dennis 2016.) In general, data gains value as it is shared, but it has little value if governments hoard it. While there is little empirical proof, open data appears to have important spillover effects, including increasing civil discourse, improving public welfare and a more efficient use of public resources. But many states lack right-to-information laws or do not allow their citizens to view or comment on the data they hold (Open Data Barometer and World Wide Web Foundation 2018; Centre for Law and Democracy 2018). So not only is there a patchwork for FTAs, as Figure 4 illuminates, there is a patchwork of approaches to governing personal data and public data.

Without sufficient understanding and interaction with data-driven firms and their customers, developing-country policy makers may struggle to effectively advocate for their short- and long-term interests in the data-driven economy. As Ciuriak (2018b, 9) notes, no one knows how trade rules will affect the future of the data-driven economy, “which in turn raises the question of whether parties signing onto trade agreements that introduce measures on data understand the value of the concessions they are making.”

Zimbabwe provides an example. The government signed a strategic cooperation framework

Figure 4: The Patchwork of Rules Governing Cross-border Data



Note: Prepared by Kailee Hilt.

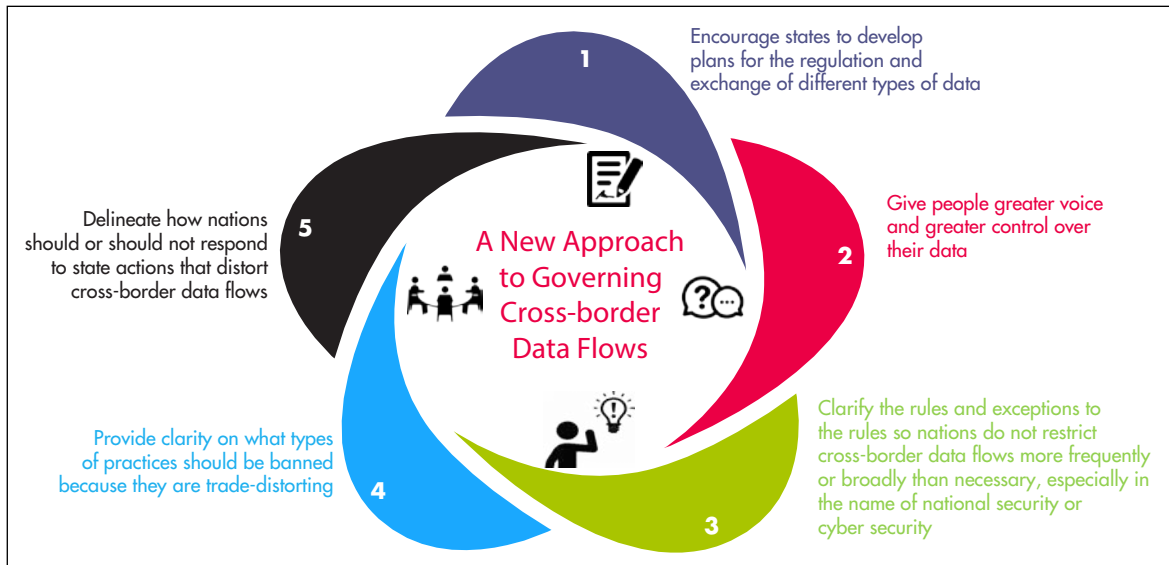
agreement with a Chinese start-up, CloudWalk Technology, for a large-scale facial recognition program. Zimbabwe will export a database of its citizens' faces to China, allowing CloudWalk to improve its underlying algorithms with more data. The government allegedly agreed to the system to improve public safety, while the company wanted to improve the accuracy of its facial recognition system, which was based on Chinese faces and needed a wider range of facial types. However, the government of Zimbabwe could use this system to more closely monitor its citizens, which could undermine social stability and trust (Hogarth 2018; Jie 2018). While such a situation may be rare, it provides a strong rationale for Zimbabwe and other countries to develop and debate a strategy for data.

A Path Forward

Humans have long exchanged data across borders, but never have they traded so much data or benefited from so many new services built on data. These new services may make us smarter, richer, more flexible and more efficient. But not all countries or people are ready to participate in this brave new world.

The OECD recently noted that governments and stakeholders have a responsibility to “shape a common digital future” that improve[s] peoples’ lives and boost[s] economic growth for countries at all levels of development, while ensuring that nobody is left behind” (OECD 2018). For governance to succeed and be trusted, it needs to be built on shared norms and rules. But many

Figure 5: A New Approach to Governing Cross-Border Data Flows



Note: Prepared by Kailee Hilt.

developing countries have not yet developed norms for the use of such data, let alone rules.

As shown in the previous section, the world has a patchwork of rules governing personal and public data. Moreover, most of these laws are not consistent with the OECD principles or the European Union's GDPR (Consumers International: 2018). The WTO (2017) also found a patchwork of approaches governing e-commerce; a similar patchwork could hamper the data-driven economy.

Policy makers may find it even harder to find common ground on norms and rules to govern how data is sold, utilized, managed and packaged. Processed data can bring down governments, alter the trajectories of firms and create other unanticipated spillovers. Technologies are changing rapidly. And many states are not aware of the utility and value of their public and personal data.¹⁶

Policy makers should first work at the national level to develop a national strategy for data and then move toward interoperability of approaches rather than harmonization. Finally, they must find a way to conduct these discussions that builds public trust, consistent with the multi-stakeholder processes embedded in other forms of internet governance. Given these factors,

this paper suggests five steps, summarized in Figure 5, that can help policy makers prepare to build rules to govern cross-border data flows.

Step one: Encourage states to develop plans for the regulation and exchange of different types of data. Given the complexity of data, its role in new services, and the importance of data to economic health and political stability, every nation should develop a strategy for how public and personal data is to be used and exchanged across borders (a national data plan). The plan should focus on ensuring that public data is open, and personal data, especially personally identifiable information,¹⁷ is adequately protected.

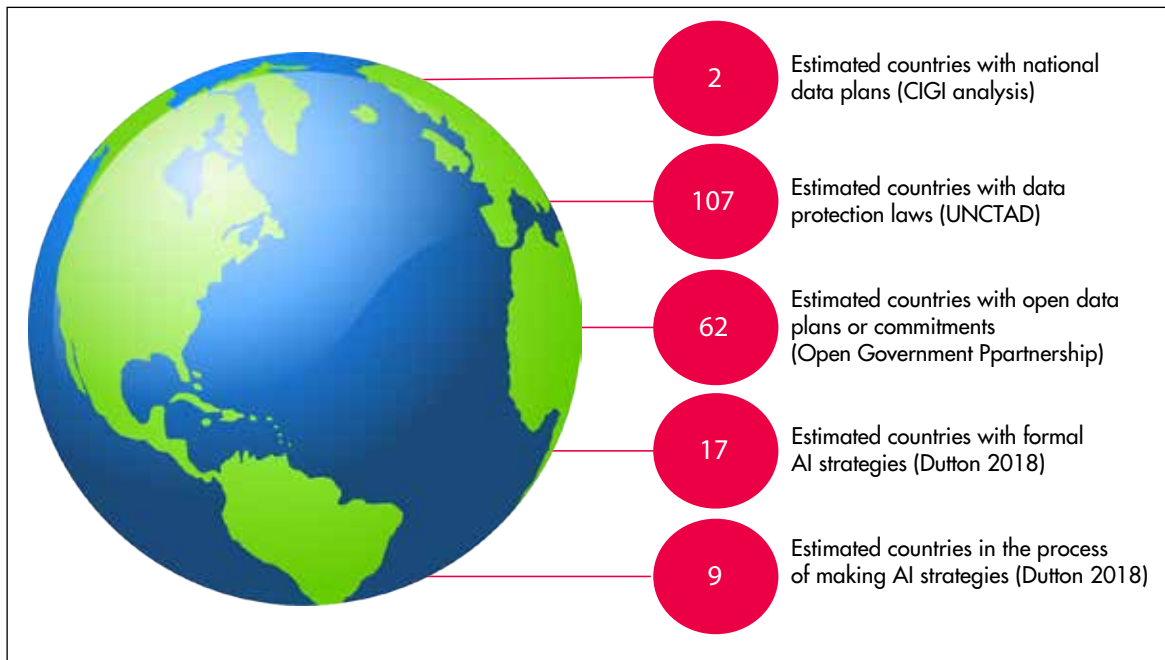
Such a plan should address issues of ownership, control, equity (is the data developed and analyzed in an even-handed manner?) and monetization of data (who can earn money for data and how?). Policy makers will also have to address issues related to the cloud and data transfer — how a country can control the transfer of data that might include personally identifiable information or data that is important for national security (Scassa 2018).

For most states, developing such a plan will not be easy. Policy makers will need guidelines, incentives

¹⁶ The appendix delineates some of the countries with various types of data plans.

¹⁷ Personally identifiable information is information that can be used to identify, contact or locate a single person, or to identify an individual in context.

Figure 6: Readiness for the Data-driven Economy Countries by the Numbers



Note: Prepared by Kailee Hilt.

and technical assistance. Moreover, most advanced economies are in the early stages of developing such plans, as they wrestle with disinformation, the ethics of AI and the digital disruption of various sectors. But some nations/trade blocs are way ahead. The European Union developed an EU-wide data strategy focusing on types of data, giving citizens in the European Union some control over use of their data. It also established a road map that enables EU policy makers to monitor the progress of member states (European Commission 2017). Meanwhile, the United Kingdom (Evenstad 2018), Canada (Government of Canada 2018) and Australia (Hendry 2018; Australian Government 2018) are in the process of developing their own data strategies to match their digital trade strategies. Mexico, Australia and Brazil have put forward public data or data innovation strategies and Canada is in the process of developing such a strategy.¹⁸ In addition, some countries are putting in place plans to facilitate the development of data-driven sectors. For example, the 75 members of the Open Government Partnership pledge to develop plans to make public data open to all.

The Digital 7, or D7, is a group of governments committed to encouraging the data-driven economy and e-government (Estonia, Israel, New Zealand, South Korea, the United Kingdom, Canada and Uruguay).¹⁹ Figure 6 illuminates some basic statistics on the status of national data strategies.

International trade and development organizations such as the World Bank and UNCTAD could work with civil society groups skilled in data issues (such as Privacy International, the Open Government Partnership, and so on) to bring these issues to the fore and provide technical assistance. Canada could also convene an international meeting to help nations weigh the best strategies for national data plans.

Step two: Give people greater voice and greater control over their data. For the data-driven economy to succeed on a foundation of trust, the providers of personal information must have the rights to control their data. A growing number of data protection plans include some element

¹⁸ See, for example, Brazil (2018); Government of Canada (2018); Australian Government (2017a); <https://industry.gov.au/innovation/Digital-Economy/Pages/default.aspx>.

¹⁹ See www.digital.govt.nz/digital-government/international-partnerships/d7-group-of-digital-nations/.

of consumer control over personal data.²⁰ Policy makers should call for an international meeting to establish an interoperable approach to data protection and control that allows nations to evolve their own complementary approaches. The meeting should be attended by a diverse set of individuals, firms and agencies involved in privacy and data protection issues, and it should be tasked to build on existing principles such as the APEC and OECD privacy principles.²¹ Companies and data protection officials have already found some common ground on helping companies that move data globally transcend different regulatory strategies (Carson 2014; 2015). But there seems to be a growing sense that the US approach is too focused on ensuring that personal data can be utilized as a commercial asset, while the European Union has put its citizens, the suppliers of personal data, first.

The organizers should establish a web site that will be “marketed” by participating governments. The architects of the site will ask netizens to crowdsource ideas about how to build on these existing principles while simultaneously empowering people to control their personal data (World Economic Forum 2011).

Step three: Clarify the rules and exceptions to the rules so nations do not restrict cross-border data flows more frequently or broadly than necessary, especially in the name of national security or cyber security. Like other agreements, a data-driven economy agreement should include rules and exceptions to the rules. Nations use the exceptions when they need to breach the agreement to achieve other important policy objectives such as protecting national security. They can only use these exceptions if they do so in the least trade-distorting manner. However, there is no clear model that policy makers can use to distinguish between legitimate and trade-distorting data flow regulation. Figure 7 shows that governments have a wide range of reasons to restrict cross-border data flows.

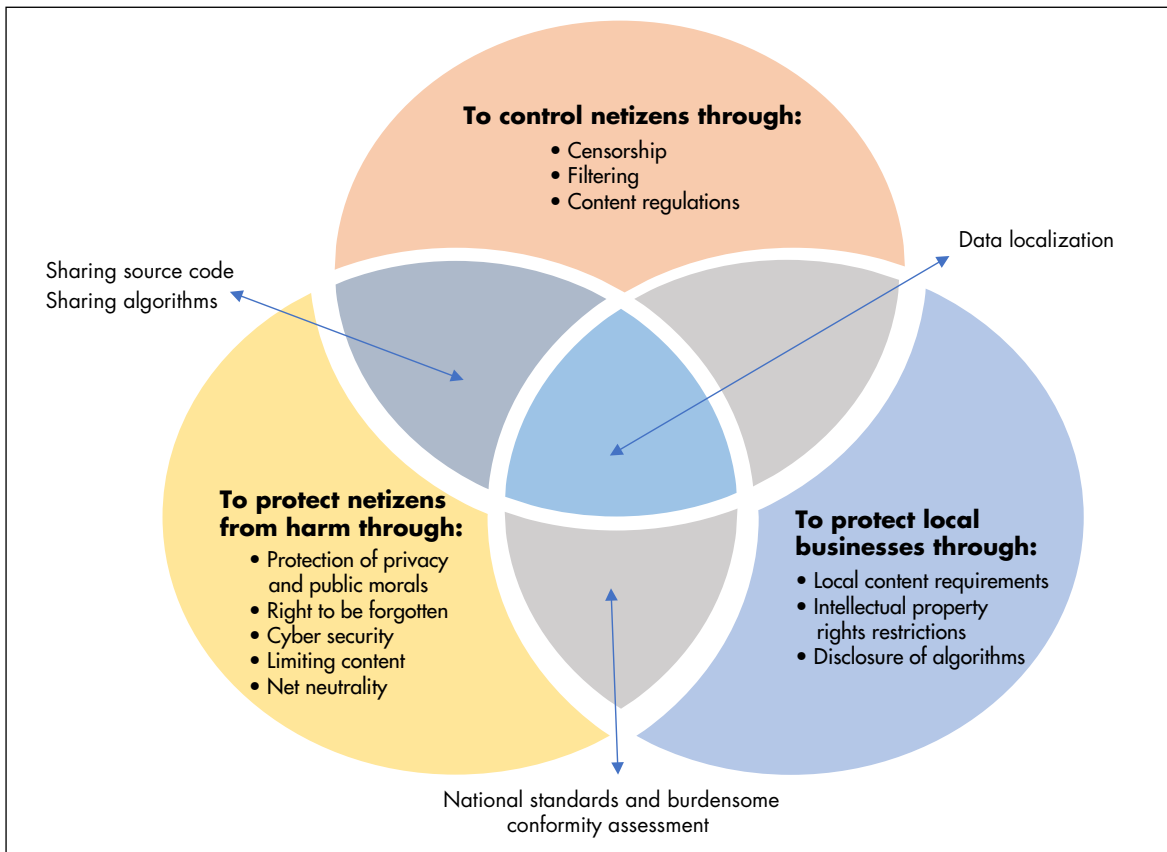
20 For an overview of data protection laws and regulations see <https://digitalindex.consumersinternational.org/search/category/data-protection-and-privacy/subcategory/personal-data-protection/page/1>; and control regulations: <https://digitalindex.consumersinternational.org/search/category/data-protection-and-privacy/subcategory/personal-data-control/page/1>.

21 On APEC principles, see [www.apec.org/Publications/2017/08/APEC-Privacy-Framework-\(2015\)](http://www.apec.org/Publications/2017/08/APEC-Privacy-Framework-(2015)) and on OECD Guidelines on the Protection of Privacy and Transborder Flows of Personal Data, see www.oecd.org/sti/ieconomy/oecdguidelinesonthe-protection-of-privacy-and-transborder-flows-of-personal-data.htm.

The current language in trade agreements is vague and policy makers must rely on trade disputes to develop clarity. However, there have been few disputes to guide policy makers. Meanwhile, these officials have not yet agreed on updating the WTO’s language. Policy makers should begin by delineating how and when nations can use the exceptions to limit cross-border flows in the name of protecting domestic security or cyber security. For example, some governments, such as India, Brazil, the United States and the United Kingdom, have called on companies to provide back doors to encrypted communications to help law enforcement. However, such an encryption back door would undermine trust and the effectiveness of encryption as a tool for keeping individuals, firms and governments safe online. Without encryption and anonymity, people will not feel secure to express themselves online.

Step four: Provide clarity on what types of practices should be banned because they are trade-distorting. Beyond data localization and taxation of e-commerce, there is little agreement as to what measures distort cross-border data flows (WTO 2017; Aaronson 2018b). For example, many Western countries believe that censorship is a trade barrier that can undermine the many benefits of the internet. Yet no trade agreement discussing cross-border data flows mentions censorship, filtering or internet shutdowns as a barrier to trade that should be banned. Many states censor, filter or shut down the internet for a variety of reasons, including safeguarding government authority, fighting terrorism, maintaining national security or protecting local businesses. When they censor, filter or shut down the internet, they determine what data will be available within their borders (Chander and Le 2014). Authoritarian states are not the only states that censor data. The Government of India, the world’s largest democracy and a technology leader, had 54 internet shutdowns — more than any other nation — in 2017. Human rights groups view these shutdowns as an intentional form of censorship that distorts the free flow of data. These shutdowns have huge economic costs, estimated at some US\$3 billion for 2012–2017 for India alone (Kathuria et al. 2018). Brookings scholar Darrell West (2016) estimated that for the world, internet shutdowns cost \$2.4 billion in 2015 alone. Government officials must find common ground on defining and regulating these practices or they cannot reap the benefits of economies of scale on data. Shutdowns may also create costly

Figure 7: Why and How Do Governments Restrict Cross-border Information Flows?



Note: Prepared by Caitlyn Leong.

spillovers such as reducing internet stability and scientific progress (Box 2016; OECD 2016).

Step five: Delineate how nations should or should not respond to state actions that distort cross-border data flows. Trade rules allow signatories to respond to the trade-distorting practices of their trade partners with compensatory practices. The agreement should clearly state that party responses should be limited and proportional in such instances and define what is limited and proportional. Moreover, any agreement should also clearly state that adopting protectionist strategies such as tariffs and quotas, or turning to strategies such as malware, are inappropriate responses that could reduce cross-border data flows. According to trade scholar Patrick Leblond, “ideally, the response should increase the costs of doing business and penalize proscribed practice but not penalize the sources of data.”²² Data protectionism will beget

further data protectionism, undermining the usefulness of the internet (Box 2016; OECD 2016). We may be seeing evidence of this phenomenon between the United States and the European Union. After US Secretary of Commerce Wilbur Ross (2018) called the EU approach to data protection trade distorting in May 2018, the European Union began to propose tax and regulatory policies to challenge what some see as the monopolistic control of US internet giants (European Commission 2018b).

Conclusion

Although the world is awash with data, some firms, mainly in the industrialized world, are increasingly able to utilize and monetize that data. Meanwhile, there is no consensus on how to regulate data at the national or international levels.

²² Patrick Leblond, email to author, July 10, 2018.

Many nations are not ready or able to develop norms and rules regarding data. Yet we must try.

Because trade in data is different from trade in other goods and services; policy makers must find common ground on norms and then rules. Moreover, trade policy makers must do a better job of helping states delineate an appropriate enabling environment for data as they did for e-commerce, so nations can both encourage cross-border data flows while limiting allegations of digital protectionism.

These ideas will not address all the issues that arise in regulating cross-border data flows. But clearly, we are stuck in a rut on trade, and must creatively address the trade and non-trade dimensions of cross-border data flows. Policy makers from a wide range of countries may be more willing to compromise if they see their citizens will benefit from clear interoperable rules and from receiving funds for their data. This approach could help firms accommodate national differences regarding ethics of data usage, disinformation and other regulatory issues. Moreover, these ideas could give developing countries greater leverage in discussions of data flows, where they would ordinarily be “rule takers” (Aaronson and Leblond 2018).

In sum, by collaborating and rethinking the process of global rule making on data, data is more likely to drive sustainable and equitable growth.

Appendix: Overview of Countries with Domestic Policies to Regulate Data or the Data-driven Economy

Country	Open Data Plan (Aside from Open Government Partnership Action Plans and National Open Data Portals)	Big Data Plan (Aside from public service plans)	AI Plan	Industry 4.0 Plan	Data Protection Law
Argentina	N/A	N/A	N/A	N/A	Personal Data Protection Law (2000) Draft bill for a new data protection act (2018)
Australia	National Action Plan to Advance Open Data (2013) Open Data Policy (2015)	N/A	2018-2019 budget announced a four-year investment to support the development of AI in Australia	Funding given to advance new scientific and technological developments-included industry 4.0 (2018)	Privacy Act (1988)
Brazil	The Brazilian Open Data Policy, instituted by Decree No. 8.777 (2016)	N/A	N/A	Advanced Manufacturing Plan for Brazil (2018)	Protection of Personal Data Bill (2011) Internet Bill of Rights (2014)
Canada	Action Plan on Open Government 2.0 (2014) (includes four specific commitments to unlock the economic potential of open data)	National Data Strategy (in progress)	Pan-Canadian Artificial Intelligence Strategy (2017)	Strategic Innovation Fund (2017)	Personal Information Protection and Electronic Documents Act (PIPEDA) (2000)
China	N/A	National Big Data Strategy (in progress)	A Next Generation Artificial Intelligence Development Plan (2017) Three-Year Action Plan to Promote the Development of New-Generation Artificial Intelligence Industry (2017)	Made in China 2025 (2015)	National Standard for Personal Data Protection (2018)

Country	Open Data Plan (Aside from Open Government Partnership Action Plans and National Open Data Portals)	Big Data Plan (Aside from public service plans)	AI Plan	Industry 4.0 Plan	Data Protection Law
France	Digital Republic Act (2016) -Article 30 ensures the reusability of open data	Steering committee of the New Industrial France, under the direction of the minister for industry, published a road map for big data (2014)	For a Meaningful Artificial Intelligence: Towards a French and European Strategy (2018)	Industrie du Futur (2015)	Law relating to the protection of individuals against the processing of personal data (1978)
Germany	Open Data Act (2017)	N/A	AI strategy (will be published in December 2018)	Industrie 4.0 (2017)	Federal Data Protection Act (1990)
European Union	Public Sector Information Directive (2003)	Big Data Action Plan and Roadmap (2014)	Communication on Artificial Intelligence (2018)	Digitising European Industry (2016)	General Data Protection Regulation (2018)
India	National Data Sharing and Accessibility Policy (2012)	N/A	National AI Strategy (2018)	National Policy for Advanced Manufacturing (2017)	Data Protection Bill (2018) Information Technology Act (2000)
Japan	Japan Open Data Promotion Consortium (2012)	Declaration to Be the World's Most Advanced IT Nation Basic Plan for the Advancement of Public and Private Sector Data Utilization (2017)	Artificial Intelligence Technology Strategy (2017)	Society 5.0: Aiming for a New Human-centered Society (2017)	Act on the Protection of Personal Information (2003)
Kenya	Kenya Open Data Initiative (2011)	N/A	Government set up a taskforce that will work on a comprehensive strategy to encourage and adopt emerging technologies such as blockchain and AI (2018)	N/A	Data Protection Bill (2012)

Country	Open Data Plan (Aside from Open Government Partnership Action Plans and National Open Data Portals)	Big Data Plan (Aside from public service plans)	AI Plan	Industry 4.0 Plan	Data Protection Law
Mexico	Digital Strategy (2018) (includes a section on open data)	N/A	Towards an AI Strategy in Mexico: Harnessing the AI Revolution (2018)	Crafting the Future: A Roadmap for Industry 4.0 in Mexico (2016)	Federal Law on the Protection of Personal Data in Possession of Private Individuals (2010)
South Korea	Open Public Data Policy (2012)	No specific strategy; however, large investment in big data, AI, and blockchain was announced in the 'Growth through Innovation' Investment Plan 2018	Five-year plan to strengthen the country's research and development in AI (2018)	N/A	N/A
United Kingdom	UK Open Data Policy (2016)	A strategy for UK data capability (2013) National Data Strategy (in progress)	AI Sector Deal and AI in the UK: Ready, Willing, and Able? (2018)	Industrial Strategy (2017)	Data Protection Act (2018)
United States	Project Open Data, Open Data Policy — Managing Information as an Asset (2013) The Data Act (2014) Open Government Data Act (2017)	The Federal Big Data Research and Development Strategic Plan (2016)	Preparing for the Future of Artificial Intelligence (2016) National Artificial Intelligence Research and Development Strategic Plan (2016) Artificial Intelligence, Automation, and the Economy (2016) White House Summit on AI (2018)	The Reinventing American Manufacturing and Innovation (RAMI) Act established Manufacturing USA (2014)	Privacy Act (1974)

Sources: www.dlapiperdataprotection.com/index.html?t=world-map&c=US; Dutton (2018); www.kennedyslaw.com/media/3154/asia-pacific-data-principles.pdf; www.opengovpartnership.org/countries/canada; https://unctad.org/en/Pages/DTL/STI_and ICTs/ICT4D-Legislation/eCom-Data-Protection-Laws.aspx.

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