

Post-Hearing Written Submission
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Regarding Investigations Global Digital Trade 1 (No. 332-562) and
Global Digital Trade 2 (No. 332-563) into global digital trade,
the business-to-business and business-to-consumer markets,
key foreign trade restrictions, and U.S. competitiveness

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OVERVIEW

The Information Technology and Innovation Foundation (ITIF) appreciates the U.S. International Trade Commission’s (ITC) invitation to provide a post-hearing written submission regarding its investigation into global digital trade. The following written testimony builds on my testimony before the ITC on March 6, 2018, and addresses a number of issues raised by ITC commissioners at that hearing. The ITC’s focus on the impact of barriers to U.S. digital trade represents a much-needed effort to better measure, analyze, and respond to the rise in these modern barriers to U.S. trade.

BARRIERS TO DIGITAL TRADE

Notwithstanding the fact that the best way for nations to cultivate high-growth, innovation-based economies is to get key economic framework conditions right; to create an institutional environment that supports innovation, entrepreneurship, and technical change; and to achieve across-the-board productivity growth, a growing number of countries are resorting to “innovation mercantilism”—a strategy that uses trade-distorting policies to advantage local technology firms and production activities. These countries have begun implementing a range of aggressive policies designed to increase the productivity and innovation capacity of existing enterprises while also seeking to incubate, grow, or attract companies operating in high-value-added industries such as manufacturing, information and communications technology (ICT), renewable energy, and the life sciences.

While this modern protectionism typically relies on behind-the-border regulations, not tariffs, to protect local firms, the objective and impact remains the same—to either replace foreign goods and services with local ones or to unfairly promote exports, or both. Behind-the-border barriers cover a wide range of differential health, technical, product, labor, and environmental standards, internal taxes and charges, licensing and qualification recognition, and other administrative processes. These behind-the-border measures can be further differentiated: by whether they apply to the establishment of a firm versus affecting its provision of services after establishment and measures that are discriminatory against foreign firms (to the advantage of local firms) versus non-discriminatory (meaning the regulation affects domestic and foreign firms alike). The term regulation is often used in the debates around non-tariff barriers as regulations, broadly defined, cover the full range of rules that governments impose to modify the behavior of individuals and firms in the private sector.¹

Examples of trade-distorting regulations include:

- Foreign equity limitations (disallows or limits foreign participation in which foreign capital is restricted). Such restrictions remain a significant barrier to ICT-based services trade as many ICT firms need to establish a local presence to better serve clients. Examples include measures on foreign firms that restrict direct equity stakes, requirements for foreign investment only through joint ventures, and limitations on mergers and acquisitions activity.
- Market access limitations through requirements for citizenship or residency.
- Quantitative restrictions/limitations (number of service firms permitted to operate in a market). Such restrictions have been used as part of “infant industry” strategies to protect new and incumbent firms by reducing foreign competition.

- Specification on mode of supply (such as a joint venture with a local partner or a minimum number of local employees or local directors).
- Non-recognition of qualifications and licenses (often through opaque or arbitrary mutual recognition processes for professional qualifications).
- Restrictions on the temporary entry and movement of business persons. This is a significant barrier for established computer services companies, such as those involved in outsourcing or consultancy work, as it restricts their ability to move human capital (often their most valuable asset) from the country of the service firm to the country of the customer and vice versa. Countries often restrict the number of foreign workers permitted to practice by labor market needs tests or quotas or through limited duration visas.
- General lack of transparency and regulatory uncertainty that essentially acts as a barrier to foreign firms. For example, when application procedures may be cumbersome, costly, and complex, processing times may be lengthy, rejection rates high, and the costs of reapplying high.²

Regulations are becoming the protectionist tool of choice as new technology and business practices change the nature of competition in many service sectors, such as retail, transport, and tourism.³ Uncompetitive incumbent firms in these sectors often appeal for regulatory protection to shield them from such competition. The protectionist reaction to these changes prevents the exploitation of economies of scale and thereby threatens the business models of new ICT-based services firms and the economic and social benefits they bring. In a worst-case scenario for foreign ICT firms, regulations are applied arbitrarily, with little or no warning and chance for comment, discussion, and cost-benefit analysis, and with an impact that disproportionately and unfairly affects their competitive position.

Regulatory restrictions on services trade should be limited to measures needed for legitimate public-interest purposes—such as for health, education, consumer protection, environmental, or national security concerns. Regulations undertaken in pursuit of such public policy goals should be narrow and tailored to target perceived market failures (such as competition policy or negative externalities, such as environmental impacts) or a particular social-equity objective (such as universal service access). In many cases these regulations are focused on non-trade-related issues—meaning such requirements cannot be eliminated, only made more economically efficient by being designed in such a way that minimizes the negative effect on trade. Furthermore, regulators are still adapting to the challenge of efficiently regulating foreign service firms which may deliver services via the Internet. Regulations undertaken in pursuit of such public policy goals in the Internet economy should apply to all firms operating in a nation equally, whether they are domestic or foreign-headquartered enterprises.

The more pernicious of these barriers affecting U.S. digital trade are those used with the intent to explicitly pressure U.S. ICT firms to localize economic activity as a condition of market entry. Effectively, localization barriers seek to force U.S. firms to produce locally what the firms would otherwise produce outside the nation's borders and export to another economy. For the many U.S. tech firms which rely on the distributed nature of the Internet to access a market remotely, these barriers are particularly harmful. Localization barriers

include the following four overarching types of policies: local content requirements; local production as a condition of market access; forced offsets; and forced technology or intellectual property transfer (often as a condition of market access). For instance, local content requirements—perhaps the most common and fastest growing form of localization barrier to trade—require that a U.S. video-on-demand firm include a certain proportion of local TV shows and movies. Equally, the requirements of countries such as China, Russia, or Indonesia that U.S. firms must locate data centers or other ICT infrastructure locally as a condition of providing digital services to businesses and consumers in the country constitute localization barriers to trade. So too do requirements that U.S. firms transfer their technology or intellectual property as a condition of competing in a country’s marketplace. But while localization barriers to trade come in many forms, there are many other barriers, as the sub-sections on cloud services and Internet-based over-the-top services show.

THE IMPACT ON U.S. PRODUCTIVITY, COMPETITIVENESS, AND INNOVATION

The United States is home to many of the world’s leading information technology and service firms, so foreign barriers to trade will inevitably affect their contribution to productivity and innovation at home. At its core, greater services trade is important to policymakers as it can enable higher levels of productivity, which is the driver of long-term and sustainable increases in living standards and economic growth. In its simplest form, productivity is a measure of economic output per unit of input (i.e., it is an efficiency measure). ICT-driven services trade can drive productivity by introducing a new service or technology that enables many/all sectors to improve (the growth effect), which accounts for the vast majority of productivity growth across all economies. The other way countries can increase their productivity comes when more productive firms gains market share at the expense of less-productive firms (the share effect), something which can occur when domestic (or foreign enterprises) open a more efficient production facility for servers, or autos, for instance.) Thus, these two forms of productivity apply as much to the state of competition in the global economy as they do to a country’s domestic economy.

Barriers to U.S. digital trade are important as they undermine—each in their own way—three critical factors that U.S. firms need to maximize innovation and competitiveness.

1. **Ensuring the largest possible markets:** For innovation industries with high fixed costs of design and development but lower marginal costs of production, larger markets are critical, since they enable firms to cover those fixed costs, so unit costs can be lower and revenues for reinvestment in the next generation of innovation higher. This is why firms in most innovation industries are global. If they can sell in 20 countries rather than 5, expanding their sales by a factor of 4, their total costs increase by much less than a factor of 4. That is why numerous studies have found a positive effect of the ratio of cash flow to capital stock on the ratio of R&D investment to capital stock. But a host of different innovation mercantilist policies act to limit global market size, both at the enterprise and establishment level.
2. **Limiting nonmarket-based competition:** Large markets enable firms to sell more. But if larger markets come with larger numbers of competitors, total sales per firm can remain the same or even fall. Conventional wisdom holds that this competition is good for innovation. However, many studies have demonstrated that innovation and competition can be modeled according to an inverted “U”

relationship, with both too much and too little competition producing less innovation.⁴ Some innovation mercantilist policies—including discriminatory government procurement practices, protected state-owned enterprises, and government bailouts—enable weak firms to enter into or remain in a market, siphoning off sales from stronger firms and reducing their ability to reinvest in innovation. An example would be policies which protect and keep traditional telecommunications firms in the market despite their inability to compete with new Internet-based communication services.

3. Ensuring strong intellectual property protections: Firms in innovation-based industries depend on intangible capital, much of it intellectual property. Strong intellectual property protections are needed to enable inventors to realize economic gains from their inventions, which further gives them the ability to reinvest those profits into the next generation of innovative activities. However, if competitors are able to enter into and/or remain in a market because they obtain an innovator's intellectual property at less than the fair market price (either through theft or coerced transfer), they are able to siphon off sales that would otherwise go to innovators.

As the Organization for Economic Cooperation and Development (OECD) has noted, the sheer size of the services sector makes it evident that any significant improvements in global productivity and income must come from the services sector.⁵ However, while not as easy to measure as the impact of tariffs, non-tariff barriers, particularly for ICT services, are real and significant and substantially detract from the potential of ICT services to bolster productivity and innovation within nations. In this way, services trade barriers are often overlooked, despite the facts that OECD estimates reveal that the trade-cost equivalent of services trade barriers largely exceeds the average tariff on traded goods.⁶ The World Trade Organization (WTO) also finds that these types of localization barriers to trade and other non-tariff barriers are twice as trade restrictive as traditional tariff barriers and account for the majority of trade barriers in place among countries today.

Fair and open global services trade would boost U.S. ICT firms' competitiveness as it enables more productive U.S. firms to benefit from greater global market share. One of the reasons why manufacturing productivity has grown more rapidly than services is that for many manufacturing industries, the technology (and global trading rules) enable firms to gain scale, which translates into lower prices. In this aspect, services trade has not benefited as fully from the economies of scale that multiple rounds of multilateral trade negotiations have delivered with tariff cuts for manufactured goods, which started with the General Agreement on Tariff and Trade (GATT) in 1947. Another is that larger firms are more productive than smaller firms and, in many economies, small, inefficient service firms dominate the economy and keep the economy locked into a path of stagnant or low productivity. For example, in Europe, the economies with the highest productivity—Germany, Switzerland, and the United Kingdom—have the smallest proportion of workers in small firms.⁷ On the other hand, those with the lowest productivity, such as Greece, have the highest percentage of small firms in Europe.⁸ It's time that U.S. and other policymakers use trade policy to enable the transformation of services, as we did for manufacturing, with the productivity gains to follow, for all nations.

In addition, more open trade and competition spurs innovation, both in the United States and in foreign markets.⁹ In response to foreign competitors, firms often turn to digital technologies, such as for the

automation of data-intensive production processes. In another reaction, firms invest in their workers or rethink their business models in order to increase their productive use of capital and labor.¹⁰ This process is relevant to both U.S. firms operating overseas as well as to their foreign competitors. Schumpeterian growth models illustrate the mechanism whereby firms will invest in technologies new to the firm to reduce costs and to get ahead of the competition—albeit temporarily, as the competition reacts to competitors’ advances. Where this process especially plays out is in fast-growing sectors with many firms using new technologies. These firms are characterized by a high level of firm churn and market structures featuring neck-and-neck competition, forcing firms to enhance their efficiency by investing in more-productive technologies. This link between competition, technology, and productivity is well studied as it is a crucial link in economic growth and competitiveness.¹¹ The added benefit is that exposure to foreign competition flows to all firms in an economy, whether traded or non-traded, and whether in services or goods industries. However, barriers to service trade mean that leading U.S. firms may be unable to fully capitalize on their innovations (which is often the basis of their competitive position) or to capture “Schumpeterian profits,” which will inevitably affect their U.S.-based investments in further research, plant, training, and other operations.

CASE STUDY: CLOUD COMPUTING

The ITC’s “Global Digital Trade 1: Market Opportunities and Key Foreign Trade Restrictions” report analyzes in great detail cloud-computing services and the size of the global cloud market. Critically, it shows that the United States is clearly the largest market for cloud-computing investment.¹² Built upon large and long-term investments in infrastructure, skills, and technical know-how, this shows that U.S. firms are true world leaders in cloud services. But it also shows the importance of open markets for cloud services, as much of the future growth in the market for cloud services will occur abroad.

ITIF has reported extensively on the growing number of barriers to data flows around the world, such as in “Cross-Border Data Flows: Where Are the Barriers, and What Do They Cost?”¹³ These barriers differ by country and by category, but they all have a significant impact on cloud services. The clearest example of this is data localization—whereby a country forces a firm to store data within a country’s borders. Data localization can be explicitly required by law or be the de facto result of a culmination of other restrictive policies that make it unfeasible to transfer data, such as requirements that companies store a copy of the data domestically, requirements that companies process data domestically, or mandates that individuals or government consent before data can be transfers abroad. These policies represent a new barrier to global digital trade. Cutting off data flows or making such flows harder or more expensive puts foreign firms at a disadvantage. This is especially the case for small and solely Internet-based firms and platforms that lack the resources to deal with burdensome restrictions in every country in which they may have customers. In essence, these tactics constitute “data protectionism” because they keep foreign competitors out of domestic markets.

This trend toward data localization represents a real threat to the open and distributed nature of the Internet, and through it, the many leading U.S. cloud services firms operating in various parts of the global digital economy. A recent Accenture report highlights this worrying trend, warning that “digital fragmentation”—defined as the rise in restrictions on the free flow of data, information technology (IT) products, services, and talent across country borders—is disrupting the global business environment and could inhibit economic growth and innovation. The report highlights the impact and cost of this fragmentation—74 percent of more

than 400 chief information officers (CIOs) and chief technology officers (CTOs) surveyed expect to exit a geographic market, delay their market-entry plans, or abandon market-entry plans in the next three years as a result of increased barriers to globalization. More than half of the business leaders surveyed believe that the increasing barriers to globalization will compromise their ability to: use or provide cloud-based services (cited by 54 percent of respondents, versus 14 percent that disagree); use or provide data and analytics services across national markets (54 percent versus 15 percent); and operate effectively across different national IT standards (58 percent versus 18 percent). According to the report, more than half of business leaders surveyed believe that these increasing barriers to globalization will force their companies to rethink their: global IT architectures (cited by 60 percent of respondents); physical IT location strategy (52 percent); cybersecurity strategy and capabilities (51 percent); relationship with local and global IT suppliers (50 percent); and geographic strategy for IT talent (50 percent).¹⁴

The ITC's ongoing investigation into global digital trade and the impact of trade barriers is particularly welcome, as measuring—both quantitatively and qualitatively—these impacts is particularly challenging.

However, at a conceptual level, there are some clearly identifiable impacts on U.S. cloud services:

- There's the direct impact from excluding U.S. cloud providers from accessing and servicing a market due to data localization. This applies as well to countries which have highly restrictive market access conditions for cloud services or which use security reviews and other registration and licensing requirements for ICT infrastructure and services as tools to discriminate against foreign cloud providers and essentially exclude them from their markets. This inevitably affects U.S. firms' competitiveness due to the loss of benefits that would otherwise come from economies of scale.
- Some restrictions make cross-border data flows prohibitively difficult and costly or outright illegal, thus forcing firms to setup their own ICT infrastructure or use contracted providers. This type of localization barrier discriminates against foreign firms as it forces foreign enterprises to produce/provide locally what the enterprise would otherwise produce outside the nation's borders and export to another economy. This makes U.S. cloud providers less competitive due to forgone benefits in economies of scale and the increased costs that come from the duplication of facilities and the additional costs involved in regulatory compliance activities.
- Data centers are a service, but just as important, act as a critical digital platform for other services. A U.S. firm, using a U.S. cloud service, would find it easier to extend its use of these services to a new foreign market if a related cloud-based provider was already operating in that market. However, where restrictions preclude this, it reduces U.S. cloud service revenues.
- Proposals to tax data transmissions (e.g., as put forward by Indonesia) would essentially tax outbound data transmissions—"data exports"—and thereby disadvantage U.S. cloud providers.

- Countries can make market or contract access (especially for public procurement) contingent on the use of local technology infrastructure, which again, discriminates against U.S. cloud providers which may otherwise be able to provide the service remotely.

Quantifying the specific cost of restrictions on U.S. cloud companies in foreign markets is complex. Previous ITIF reporting has summarized the emerging body of econometric research into the cost of data localization. In broad terms, these studies estimate the cost of barriers to data flows in terms of lost trade and investment opportunities, higher information technology costs, reduced competitiveness, and lower economic productivity and GDP growth. These studies show that data localization and other barriers to data flows impose significant costs: reducing U.S. GDP by 0.1-0.36 percent; causing prices for some cloud services in Brazil and the European Union to increase by 10.5 to 54 percent; and reducing GDP by 0.7 to 1.7 percent in Brazil, China, the European Union, India, Indonesia, Korea, and Vietnam, which have all either proposed or enacted data-localization policies.¹⁵ These econometric models provide a valuable estimate of firm- and country-level impacts, but they don't provide detailed insight into the actual firm/sector costs caused by barriers to data flows.

The specific impact and cost of these barriers to U.S. cloud services is hard to estimate as it depends on a range of factors, such as the individual characteristics of each U.S. firm and the analysis of operational data that is proprietary (therefore making comparative analysis difficult). Any analysis also needs to consider the context between a hypothetical situation with free and open cloud services markets (i.e., best-case scenario) and the messy real world of dealing with a country's laws and regulations (which can be seen along a spectrum that moves from a "normal" level of regulation to data localization and market exclusion). In this best-case scenario, U.S. cloud firms would base their decision to setup a data center or other operations purely on best-value economic terms on an unadulterated, market-determined basis. For cloud firms, they may decide to setup a data center in a country or region in order to better serve customers through improved latency, to provide tailored services, to increase operational efficiency, such as through lower energy or construction costs, and to cater to local languages or market needs, or as part of disaster resilience plans (which may spread data centers across an area). Latency is an important consideration as it can have a major impact on services, such as financial trading and website performance, which directly flows through to trading, sales, and traffic.¹⁶

Given these market-driven factors, some countries (such as China) would naturally have data centers due to the size of the market. The issue then becomes how to discern the impact that restrictions have on U.S. cloud providers, who as world leaders, would naturally be more invested in a large and growing market, such as China. In other markets where U.S. providers do not have a data center, the impact of data localization would be to cut off any income earned from that market through the remote provision of services, thereby ceding the market to local providers. One possible way to measure this would be in a pre/post assessment of lost market share.

Quantifying the cost of restrictions also depends on the timing of the restrictions and market dynamics. As cloud services grow in countries around the world, cloud firms that are able to target and service a particular market early will have a first mover advantage, and thereby stand a better chance to become an established and known service as the market grows. Being excluded from this early-growth stage distorts a cloud market

which would otherwise likely feature leading U.S. cloud providers. This is exactly what is happening in many markets, such as China, which means that the impact of these restrictions grows over time as the Chinese cloud market continues to grow.

Any holistic assessment of the impact of barriers to U.S. cloud services needs to consider the third-order effect these have when it's combined with a concerted effort to develop national cloud “champions” that use a protected home market as a launch pad to scale up and then enter foreign markets. Alibaba is a classic example of this in China. Alibaba has used its protected home market to develop its own services, free from real foreign competition, which has then enabled it to grow in size, scale, and financial resources, subsequently enabling it to enter foreign markets, including the United States. While Alibaba and Amazon Web Services may not compete on level ground in China, they're increasingly competing against each other in third-country markets, such as Europe and India.¹⁷ Digital protectionism allows countries to subsidize domestic companies that go on to unfairly compete against U.S. firms in third-country markets. In essence, these firms claim to be competing fairly in foreign markets, but they are receiving domestic support under the table that puts their foreign rivals at an unfair disadvantage.

Restrictions on Cloud Services in China

China is a large and rapidly growing market for cloud services. The ITC's “Global Digital Trade 1: Market Opportunities and Key Foreign Trade Restrictions” report makes this clear given total cloud spending in China tallied \$1,275 million in 2015. Public cloud spending per 100 people grew from \$30.8 per person in 2012 to \$167 in 2016.¹⁸ However, China uses a range of restrictive measures to effectively preclude U.S. cloud companies from operating in the country. China makes pervasive use of digital protectionism through the use of data localization, discriminatory and arbitrary regulations, and restrictive market access conditions.

Appendix A specifies the long and growing list of data-localization requirements that China has enacted in recent years. In 2016, the United States Trade Representative Office's (USTR's) National Trade Estimate Report outlined the impact of China's many digital restrictions:

Over the past decade, Chinese filtering of cross-border Internet traffic has posed a significant burden to foreign suppliers. Outright blocking of websites appears to have worsened over the past year, with 8 of the top 25 most trafficked global sites now blocked in China. Much of the blocking appears arbitrary...¹⁹

In addition to explicit data-localization rules, China uses regulations and market-access restrictions to discriminate against foreign cloud service providers. In 2016, new regulations regarding cloud-computing services in China confirmed the country's persistence in erecting barriers between its tech sectors and digital economy and those of the rest of the world. In March 2016, China made significant changes to the licensing and regulatory regime of Chinese telecom and Internet services that essentially exclude foreign technology firms involved in cloud computing, big data, and other information services from operating in China. These regulations, again, reinforced the requirement for forced local data storage.²⁰ For foreign cloud-service providers—which include many leading U.S. companies—these regulations have essentially closed access to the Chinese market.

China has enacted regulatory changes to make it even harder than it already was for foreign companies to establish and operate Internet-based information services in the country. First, China released regulations for several services it considers valued-added telecommunication services (VATS). By categorizing Internet-based services (e.g., cloud computing, big data, and other information services) as telecommunication services, and not as “computer and related services,” it has much greater freedom to restrict market access to foreign tech firms. This is because China made commitments as part of its accession to the World Trade Organization in 2001 to provide nondiscriminatory treatment and market access to foreign firms in “computer and related services.”²¹ This category of Internet-based computer services includes email, voicemail, online information and database retrieval, electronic data interchange, and enhanced facsimile services, code and protocol conversion, and online information and/or data processing.²² Essentially, China’s approach is a technical work-around to avoid its commitment to open its market for Internet-based computer services to foreign competition.

Second, China introduced a requirement for telecom and Internet Service Providers (ISPs) to apply for licenses for each subcategory of services, raising the potential for government agencies to discriminate against foreign firms. For example, China’s new subcategory, “internet-based resources collaboration services,” means that providers of cloud-computing application services, platform as a service, and software as a service would potentially have to apply for multiple licenses, given that some firms and services cross over into multiple categories.

Third, China released new requirements that articulate the very small and restricted cloud-computing services space in which foreign firms are allowed to operate. In October 2016, the Ministry of Industry and Information Technology released the “Notice on Regulating Business Behaviors in the Cloud Service Market,” which outlined how foreign cloud companies are forbidden from working via local partnerships in any capacity beyond “technical assistance.” It is not specified what is allowed under “technical assistance,” but based on current practice, it is likely to mean that foreign companies are only allowed to license their goods (software and hardware) to their (forced) local partners and show them how to use them. The notice further specifies several activities that cloud-service providers cannot perform, such as sign contracts directly with end users.

These new restrictions on foreign cloud service providers make an already restrictive situation that much worse. Strict entry requirements and (an already highly) discriminatory licensing process have largely kept foreign firms out of China’s market. To operate in China, foreign firms must set up a joint venture with a Chinese partner, which must enjoy majority ownership (i.e., greater than 50 percent). A joint venture was a prerequisite for foreign firms to even apply for a license from Chinese authorities, who have proven to be highly discriminatory against foreign firms. Although there are over 20,000 local companies licensed to provide VATS in China, only 30 or so licenses have been issued to foreign companies, including 5 U.S. companies.²³

Only a very few large foreign firms have successfully run the gauntlet and decided to operate in China within the confines of these strict conditions by partnering with large Chinese firms—for example, Microsoft with

21Vianet (China's largest private data-center operator), SAP with China Telecom, and IBM with a group of local companies.²⁴ As described, these foreign firms are severely restricted in what they can do, often being constrained to arrangements whereby they license their products to their local partners, who set up and run the data centers and cloud services and manage relations with end users.

This mercantilist approach to cloud computing is consistent with China's ongoing efforts to develop a local cloud-computing sector that uses indigenously developed technology. China's ambitions in the sector started as part of the country's "National Medium and Long-Term Plan (MLP) for Science and Technology Development (2006-2020)." Building on this in 2010, China identified cloud computing as 1 of 11 strategic emerging industries that would receive special attention and funding, all in pursuit of the goal of expanding access to cloud resources in China, developing indigenously cloud-computing technology, and creating an internationally competitive Chinese cloud-computing sector. More recently, the Ministry of Science and Technology's "12th Five-Year Plan (2011-2015)" paid particular attention to cloud computing, where the aim became to develop a cloud-computing standard based on indigenously developed technology.²⁵ These policies, taken together, illustrate China's efforts to use mercantilist policies at home to support the development of "local champions," which will eventually become more innovative and competitive and able to compete in overseas markets—against the very tech firms that are unable to compete in China.

Restrictions on Cloud Services in Russia

While Russia's cloud services market is small, it is growing, as the ITC's "Global Digital Trade 1: Market Opportunities and Key Foreign Trade Restrictions" report outlines. Total spending in Russia on cloud services was \$317 in 2016. Public cloud spending in Russia per 100 people grew from \$88.3 in 2012 to \$270 in 2016.²⁶ Unfortunately, the rise of Russia's cloud services market has coincided with restrictions on the storage of telecommunications, personal, and financial data that make Russia an increasingly difficult market for U.S. firms.

The Russian government's parallel moves toward mercantilism and authoritarianism came together in a new surveillance law that includes extensive data-localization requirements for telecommunications data. On July 6, 2016, Russia enacted a new law that forces telecommunication companies and ISPs to retain user communications for six months and communications metadata for three years. The law will apply to companies in Russia and overseas. Companies have until July 1, 2018, to implement these measures.²⁷

The law purportedly aims to help Russian authorities fight terrorism, but its impact will be felt economy-wide (and society-wide), especially by Russia's digital economy. First, the surveillance and localization requirements are much broader than other countries' telecommunications data-retention requirements, such as those of Germany, as it requires companies to store the actual content of users' communications for six months, such as voice data, text messages, pictures, sounds, and video, not just the metadata (the who, when, and how long of communications). Second, it requires telecommunications companies and ISPs to cut services to a user if they fail to respond to a request from law enforcement to confirm their identity (which raises a range of privacy issues). Third, it forces companies to help government authorities in decrypting user communications and prohibits encryption measures unless a decryption tool is available should Russian authorities need it. Fourth, it applies to foreign companies that fall within the broadly defined category of telecom providers and

“facilitators of information dissemination by means of the Internet,” such as online messaging services, email providers, social media and blogging sites, voice over Internet protocol services (which use the Internet to transmit voice and multimedia), and news sites.²⁸

In 2015, Russia enacted a law that forces companies with Russian personal data to store the data locally.²⁹ The ramifications of this law are significant. Firms that intend to continue doing business in Russia which do not currently process or store personal data inside Russia will have to spend considerable sums establishing data centers or transfer data to Russian storage providers. The law also requires firms possessing the personal data of Russian citizens to notify Russian federal authorities about the actual location of servers, which raises security concerns. It’s unclear exactly what impact the law will have on cross-border transfer of personal data, which is allowed by Russian law. It requires that data on Russian citizens must *first* be recorded, systematized, accumulated, stored, amended, updated, and retrieved in a Russian database, but it does not stipulate if and how data may then be transferred to secondary databases outside of Russia. Russia’s telecommunications ministry concedes there’s legal uncertainty for companies about how to comply.³⁰

While the law primarily targets cloud providers, it also has a significant impact on websites which collect and use Russian personal data and which use ICT services outside the country to access the market remotely. Firms breaching the law can be fined or have their websites blocked.³¹ Many foreign technology and Internet companies have had to move personal data in-country. Apple, Google, Samsung, Uber, and E-Bay have indicated they plan to comply by setting up servers or moving data to Russia. Roskomnadzor, Russia’s data protection agency, told Twitter it would audit it by the end of 2018 to ascertain if it was storing Russian personal data in Russia.³² Roskomnadzor has also threatened to block Facebook if it does not comply with the law by the end 2018.³³ In November 2016, Roskomnadzor blocked LinkedIn after the company made clear that it would not move Russian user data (it has 6 million Russian users) into Russia.³⁴

Russia also effectively requires local data storage for financial data. Bank of Russia regulations on cloud storage services requires financial institutions to store their data in Russia. The regulations don’t include an express prohibition on data transfers or overseas data storage, but only allows it after data is first recorded in Russia and after the foreign cloud provider fulfills a range of prescriptive security measures. Furthermore, the storage and processing of certain data by cloud providers for financial institutions triggers licensing and certification requirements, such as licensing for activities relating to the protection of confidential information (the scope of which is defined very broadly and would include, inter alia, any personal data), encryption licenses, and the certification of ICT systems used for the storing and processing of this financial data. In practice, only Russian entities can satisfy these requirements, thus meaning the regulations present a practical obstacle for foreign cloud providers.³⁵

Once these data localization laws are fully enacted and enforced, the impact they will have on U.S. cloud providers will increase. These policies will certainly chill Russia’s digital economy, as they make it harder and costlier for both domestic and foreign firms to operate. Russian telecommunications companies have complained about the large potential costs of implementing these extensive and intrusive laws. MegaFon, Russia’s second-largest mobile-phone company, said that equipment and operating costs of implementing this new law are estimated to be around \$3.6 billion.³⁶ These costs inevitably get passed on to customers, which

drags down economic growth. Tele 2, another Russian mobile-phone provider, said that it would likely have to raise prices by two or three times to cover the costs of implementation.³⁷ A study by the European Centre for International Political Economy regarding Russia's data localization law shows that it will lead to economic losses equivalent to 0.27 percent of Russia's GDP in 2015, or approximately \$5.7 billion. The study also estimates that it would reduce investment in Russia by 1.41 percent this year, worth \$2.6 billion.³⁸

CASE STUDY: OVER-THE-TOP/INTERNET-BASED SERVICES

More and more countries are enacting trade barriers that increase the cost and complexity, or preclude, U.S. firms from using the Internet to access foreign markets to deliver a range of modern digital services, especially as it relates to voice, text, video, and audio. The United States is home to many of these world-leading Internet-based services, often called over-the-top services (OTTs), for how they use a network to bypass traditional providers. OTTs are increasingly popular with consumers, in part due to the growth of smart phones and other devices. However, countries are using a range of trade distorting and unnecessary/excessive "localization" measures for data, personnel, financial and accounting, content, and taxation to discriminate against U.S. tech firms.

OTT services utilize converged broadband Internet networks—which can manage voice, data, and multimedia traffic—to provide services, often (though not always) without the direct involvement of the Internet service providers, which are often traditional telecommunication and broadcast cable TV operators. Examples of OTT services include:

- Voice over Internet Protocol (VOIP) services (e.g., Skype, WhatsApp, Viber, FaceTime, etc.);
- IP messaging services (e.g., WhatsApp, Line, WeChat);
- Audio-visual content (e.g., Netflix, Apple TV, ShowMax, YouTube, Hulu, iTunes);
- E-commerce platforms and services (e.g., Amazon, Internet banking, cloud services); and
- Social media services (e.g., Facebook, Twitter, Pinterest, LinkedIn, Instagram).

A growing number of countries—Brazil, Colombia, the European Union, India, Indonesia, Thailand, Vietnam, and Russia—are considering or enacting measures to regulate Internet-based communication and video services that discriminate against U.S. tech firms. While motivations vary, and often involve legitimate public policy concerns (such as taxation), a common refrain is that restrictions are needed to protect uncompetitive traditional telecommunications and broadcasting companies. These measures serve to protect incumbent and traditional telecommunications and broadcasting providers, impede trade in online services, and make it substantially more difficult for U.S. firms to access foreign ICT services markets.

Examples of these types of restrictions:

- Licensing or registration requirements,
- Local (physical) office and staff,
- Local content requirement (for videos and movies),
- Local data storage,

- Taxation treatment as traditional broadcasting or telecommunication,
- Taxation treatment that requires a physical presence, and
- Local content funds contribution, and other regulations.

Many countries are enacting these measures to “level the playing field” between incumbent and Internet-based firms, often at the behest of these traditional voice/broadcast firms, which are struggling to compete against OTTs. However, given it features in the debate in many countries, it’s important to realize that the relationship between the two sides is not win/lose, but one of interdependence. For telecommunications firms, declining demand for traditional voice and text messaging services is counterbalanced by increasing demand for data, which is partly driven by OTTs. OTTs need a reliable high-speed network and telecommunication firms need Internet-based applications to stimulate demand for data traffic. Further still, some traditional operators also provide their own content services, so they may be competing with OTT video services.

A growing number of countries are using policies pertaining to a “physical presence” to erect a virtual wall around their digital economies, exploiting the reality that international trade rules are out-of-date in addressing digital barriers to trade. Countries are able to pursue such trade-distorting policies as there is uncertainty whether current international trade rules apply to these Internet-based services. For example, a basic question is whether OTT services are covered by existing services classifications. Are OTT voice and messaging services a form of “mobile telephone services” or a form of “data and message transmission services”? What about the online distribution of audiovisual content?³⁹ Along similar lines, do commitments countries took on at the WTO with regard to telecom services cover OTTs or not?⁴⁰

The impact of these restrictions on U.S. firms are significant, and likely to grow, as OTTs become more popular and common around the world and as these types of restrictions spread. Again, quantifying the specific impact is difficult, but conceptually, the impact would be along the same lines as outlined in the section on cloud services. However, the impact could be much broader, in that OTT services potentially cover a broad range of services. The lack of a clear and widely agreed definition of OTTs and related sub-categories means that the impact of restrictions is shaping up to be quite broad, as some countries (such as Indonesia) have used vague and broad definition of OTTs to extend restrictions over a vast part of the digital economy. U.S. firms face the growing risk of being blocked (online) from accessing a market as some countries are using localization measures as a condition of market access. The impact of these restrictions will be especially hard on small U.S. firms as they don’t have the time, expertise, and resources to deal with such vague, expansive, and expensive regulations. In the future, the absence of a physical office could provide reason for Indonesian authorities to target foreign firms with onerous tax bills or by cutting off their digital access to the local market.

Given they’re a common target of restrictive measures, an example to consider when looking at the impact are U.S. video-on-demand (VOD) services, such as Time Warner’s HBO, Amazon Prime Video, and Netflix. Both Netflix and HBO reported record subscriber growth in 2017—HBO’s total global subscriber base stands at 142 million, while Netflix, in comparison, has 117.6 million (62 million of these are outside the United States).⁴¹ Meanwhile, Amazon Prime Video has 30 million subscribers (11 million are from Germany,

Japan, and the United Kingdom).⁴² As part of its global operations, Netflix has stated that it has \$17.7 billion in streaming-content obligations, a measure of current and future costs for content acquisition, licensing, and production. In early 2018, Netflix stated it would spend \$7.5 billion to \$8 billion on content this year, up from a forecast of \$7 billion to \$8 billion previously. Netflix has increased its international investments in recent years. More than half of its total subscribers are from countries outside the United States and it plans over 30 international-focused and local-language original series this year, including in France, Poland, Germany, Mexico, India, and Korea. In its latest quarterly report, Netflix said that its international segment contributed positively to the company's full-year profit for the first time, which demonstrates the critical role that economies of scale (and thereby market access) plays in its business model.⁴³

Brazil Considers Restrictive Measures for Internet-Based Video-on-Demand Services

Brazil has proposed a range of restrictive measures to over-the-top services that distribute videos over the Internet. On May 18, 2017, Brazil's National Agency of Cinema (known as Ancine) proposed regulations for all OTT platforms that offer videos on demand, regardless of where they are based, including periodic reports on content, users, and revenue; a 20 percent local cultural content requirement (specifying that half of this should be independently produced); and a requirement that companies make an annual investment in local production (up to 4 percent of revenue).⁴⁴ Ancine also flagged that future regulation should include other online video platforms, such as YouTube.⁴⁵ Ancine's proposals are partly in response to the arrival of major streaming services in Brazil, such as Netflix in 2011, which has provoked a reaction from pay-TV operators who want a "level playing field" with OTT service providers.

Ancine's director bases the need for mandatory national quotas, established across Brazil's film sector in 2011, on having to counter the fact that international productions are cheaper, as they're able to spread their costs over many markets.⁴⁶ Highlighting the focus on local content, Ancine's director has stated that regulations should be used to drive private investment in local production and distribution of Brazilian content.⁴⁷ On November 2, 2017, Ancine's director said that the agency will push ahead with plans to ask Brazil's Congress to approve a platform-specific law for VODs that would include a minimum local content requirement and a tax for OTT services.⁴⁸

Ancine's misguided efforts to target VOD platforms are partly based on efforts to extend a pre-OTT tax that exists for films in Brazil. Ancine charges a tax on the production, licensing, and distribution of videos in Brazil (regardless of economic results). The tax differs depending on the film's runtime and the type of video (it's a lower tax for local films and TV shows).⁴⁹ Ancine wants to extend this tax to VOD content, which would see the government charge VOD platforms a fee for each product in their Brazil catalogue lasting more than 50 minutes. The tax would also be discriminatory as the rate would be higher for foreign vs. local productions.⁵⁰

The regulations will negatively affect the many Brazilian consumers who have flocked to VOD services, which together form a large and growing market that could incentivize OTT firms to invest in more service innovations and local content. In 2016, nearly half of Internet users in Brazil watched VOD.⁵¹ In August 2016, a survey of Brazilians showed that over 80 percent had used YouTube to watch movies or TV shows, while 71 percent had used Netflix, followed by local players Globo and SBT.⁵² The popularity of VODs in

Brazil is clear, with the revenue generated by the sector growing from \$74.6 million in 2010 to \$398 million in 2015. This makes Brazil the largest VOD market in Latin America and the eighth-largest in the world.⁵³

Brazilian policymakers should avoid hasty, unnecessary, and misguided taxes and regulations lest they undermine Brazil's growing VOD market, where an increasing number of firms compete on the basis of price, offerings (both local and foreign), and services. Extending the film industry tax to OTT services would undermine the business model for all VOD OTTs. First, it would encourage them to significantly reduce the number and variety of titles to reduce their taxes. Second, it would affect consumers, as any tax and cost increases would inevitably be passed on, which would likely undermine this growing sector.⁵⁴ This in turn would reduce overall rates of broadband adoption in Brazil (indeed, a key reason people adopt broadband is for access to VOD).

The new law's focus on a minimum-content mandate also threatens to undermine the price and services available to Brazilian consumers by driving up the cost of market entry, especially for smaller platforms. Netflix's experience in Brazil provides some insights into how quickly this sector has changed and how hasty regulations can pose a problem. By coincidence, in 2011, Brazil became a testing ground for Netflix's subsequent global expansion, being its first international market at the time. Between 2013 and 2016, Netflix doubled its offering of national titles in Brazil. Furthermore, Netflix became a platform to showcase content from the region: in 2016, more than 45 percent of Netflix users outside Latin America consumed content from the region.⁵⁵ Furthermore, in March 2017, HBO Brazil (which has a regional production center in Brazil), announced 14 original Brazilian productions—its largest set of productions for a single year in Brazil.⁵⁶

These developments highlight the opportunity global platforms like Netflix and HBO present and show why Brazilian policymakers should look to incentivize, not mandate, local investments (such as through co-production measures), which can then use these local, regional, and global platforms to access broader international markets. Brazil's VOD market is rapidly growing, and if Brazilian consumers really want to view more Brazilian-oriented content, then Brazilian content producers (or even international providers) should recognize this and provide this content. If that's not sufficient for Brazilian policymakers, then they could consider subsidizing the production of additional Brazilian-produced and oriented-content, but they should not resort to a policy of mandating showing certain percentages of local content.

Indonesia Enacts Burdensome and Restrictive OTT Measures

On October 15, 2017, Indonesia enacted regulations for over-the-top Internet services that expand the range of burdensome and discriminatory policies considered in 2016.⁵⁷ As initially outlined in last year's report, Indonesia wants to use discriminatory and trade-distorting regulations to "level the playing field" between traditional telecommunications operators and new Internet-based services.⁵⁸ Indicative of this, the revised draft calls for the protection of telecommunications operators as an explicit objective and implements "fair distribution" for telecommunications.

There are many vague and potentially troubling parts of these revised provisions. For example:⁵⁹

- The provisions will introduce a burdensome regulatory regime over a potentially vast section of the Internet given it defines OTT providers as those in two broad categories: providers of Internet-based application services and those of Internet-based content services. This presumably covers both free and subscription/fee-based services. Previous versions of this regulation elaborate on the broad range of services covered: communications (video calls, emails, instant messaging services), financial transactions, data storage, search engines, social networks, and platforms that deliver content (such as for music videos and games). This means it would apply to Google search and Gmail, PayPal, Skype, Amazon Web Services, Facebook, Spotify, and local variants of these services. The potential application of new regulations to millions of phone apps alone (never mind other services) shows the impractical reach of these new regulations.
- The regulation then adds the impractical goal of trying to force foreign firms within this vast range of sectors to set up a permanent physical presence in Indonesia, including a local office and employees, as a condition of market entry.
- The regulation effectively tries to install the Indonesian government as a gatekeeper of the Internet by including the requirement that foreign OTT firms apply for a license to offer services in Indonesia. This application would include details about their local presence, such as their local tax identification number, the details of their information contact center, and their business license. This impractical (and nearly impossible) requirement effectively tries to pre-empt the launch of new Internet-based services in Indonesia.
- The regulation intervenes in how OTT firms operate by forcing them to use Indonesia's national payment "gateway" for processing electronic payments (such as ATMs, credit cards, and electronic money), which includes only using a "switching agency" that is at least 80 percent Indonesian-owned. Besides being discriminatory, this provision raises concerns about whether these local switching agencies have the expertise and capability to ensure secure and timely transactions.
- Foreign OTT firms must provide user guides in Bahasa Indonesian.
- OTT firms must set up a local bank account to manage all services in Indonesia.
- OTT firms must have an information contact center to manage questions and complaints from customers, which must be responded to within 48 hours. The details for this contact center must be provided with a firm's application for a license.
- OTT firms must submit an annual report to Indonesia's Ministry of Information and Communications, including providing information on their number of subscribers in Indonesia.
- OTT firms that do not comply will be blocked by Indonesian telecommunications companies. Full and effective enforcement would have an extensive impact. Given the broad range of sectors covered and the need for OTT firms to get pre-approval from the government before offering services, enforcement would effectively require the Indonesian government to exert control over the country's Internet.

On top of this new regulation, Indonesia is enacting a new fiscal policy to target OTT firms in an effort to extract excess taxes from the digital economy. In April 2017, Indonesia's Director General of Tax released a

new law (Circular Letter No. SE-04/PJ/2017) that forces OTT firms to create a “taxable” physical presence in the country.⁶⁰ In this way, forcing a foreign OTT firm to set up a local presence just because it has users in Indonesia is much the same as forcing a foreign manufacturer to set up an office if it happens to have customers in Indonesia.. In doing so, Indonesia’s efforts to force Internet-based firms to establish a physical presence runs counter to the emerging international consensus on how to tax the digital economy, such as reflected in the OECD’s Base Erosion and Profit Shifting (BEPS) project.

For example, a key takeaway from the OECD/G20 report “Addressing the Tax Challenges of the Digital Economy” (prepared for BEPS) is that because the digital economy is becoming an economy in and of itself, it would be difficult, if not impossible, to ring fence the digital economy from the rest of the economy for tax purposes.⁶¹ Yet, this is exactly what Indonesia is trying to do. As the OECD/G20 BEPS Taskforce on the Digital Economy outlined, a better approach would be for countries to subject cross-border business-to-consumer digital services to national value-added taxes (VATs).

Russia Enacts Measures Which Effectively Excludes Foreign Video-on-Demand Services

On July 1, 2017, a new Russian law came into force that severely restricts foreign ownership of OTT video services.⁶² The law was largely motivated by Netflix’s launch in Russia in 2016, which led to local online video services complaining that Netflix, as a global player, would present “unfair competition” to local firms.⁶³ The largely government-owned and controlled Russian media supported the law, under the guise that it equalizes regulatory burdens between traditional media and OTT services. Despite opposition from OTT firms and Internet companies and an expert government council, the bill was approved by Russia’s parliament almost without any amendments.⁶⁴

The measure requires that only a Russian legal entity or a Russian citizen (and moreover an individual who does not hold any other citizenship) can be the majority owner of such services. The new law applies to owners of Internet websites, website pages, information systems, and computer software that are used for online distribution of videos that target Russian consumers, and that are accessed by more than 100,000 users per day in Russia (as measured by a government agency). It covers both subscription-based and free advertising-supported services. Firms that have less than 50 percent of their users in Russia have to apply for government approval to own more than 20 percent of any such Russian legal entities. The law will not apply to Internet search systems or information resources that primarily distribute user-generated content. All providers who meet the criteria will need to register with the Federal Service for Oversight in the Sphere of Communications, Information Technologies and Mass Media, which has the ability to fine or block those services that do not comply with these requirements.

The impact these restrictions have had on foreign operators is clear as per a report prepared for the Council of Europe’s European Audiovisual Observatory: “to expect foreign investments in the Russian VOD market in such terms is not realistic. It is also impossible to make full launches of [a] foreign service.”⁶⁵

Some examples:

- In the middle of 2016, LeEco, a Chinese company, wanted to launch in Russia by purchasing a local firm or by using its own platform. LeEco’s representatives held several meetings with a variety of large

companies and headhunted leading experts, announcing large investments in content and devices. However, by the end of the year, the company closed most of its operation in Russia due to risks associated with this new law.⁶⁶

- Media analysts predict that the new law will force Amazon Prime and Netflix to abandon their stand-alone streaming services and instead exit the market and license content to third parties (as Netflix does in China).⁶⁷ These firms' experiences show how hard the Russian market is for foreign digital firms.
 - Amazon Prime launched on December 14, 2016; however, programming is only in English, only a few movies have Russian subtitles, and payment is in U.S. dollars.
 - Netflix launched in Russia in the beginning of 2016. Perhaps indicative of the struggle to establish operations, Netflix only purchased one Russian movie in the first year.⁶⁸ Netflix may be able to avoid many of the new law's restrictions (at least in the short term) if it has less than 100,000 Russian users, which it would need to prove to Russian government agencies.⁶⁹ However, implying that Netflix is beyond this threshold, in April, 2017, the head of Russia's communications agency said that Netflix would have to partner with a Russian company to continue operating in the country.⁷⁰

CONCLUSION

It is imperative that the United States do more to identify, analyze, and respond to the growing number of countries which are enacting unfair and discriminatory policies that target U.S. ICT firms. The U.S.'s position as a world leader in many high-tech sectors will be undermined if these modern trade barriers continue to spread. Such a scenario would undermine these firm's ability to contribute to U.S. economic competitiveness and innovation. Likewise, it's imperative that the United States work with likeminded trading partners in addressing these barriers, including within multilateral organizations, such as the World Trade Organization, which have failed to adjust to these modern barriers to trade.

APPENDIX A

China applies the world's most extensive and pernicious set of data-localization policies, which significantly inhibits the flow of data between China and the rest of the world. To start with, it has long limited data "imports." For example, the Ministry of Public Security runs the Golden Shield program (commonly referred to as the "Great Firewall of China"), which restricts access to certain websites and services, particularly ones that are critical of the Chinese Communist Party. But, more importantly, from a trade perspective, China has enacting a growing number of policies which restrict the cross-border transfer of data in recent years.⁷¹

For example:

- In 2006, China introduced measures for e-banking that require such companies to keep their servers in China.⁷²
- In 2011, China introduced a law that prohibits the off-shore analyzing, processing, or storage of Chinese personal financial information.⁷³
- In 2013, China enacted new rules regarding credit reporting that requires all credit information on Chinese citizens to be processed and stored in China.⁷⁴
- In 2014, China enacted new rules that require health and medical information to be stored only in China.⁷⁵
- In 2015, China released draft administrative regulations for the insurance industry that included localization requirements.⁷⁶
- In 2016, China enacted new rules that force companies involved in Internet-based mapping services to store data locally.⁷⁷
- In 2016, China issued new rules regarding online publishing that require all servers used for a broad range of services involved in online publishing in China to be located in China.⁷⁸ This includes app stores, audio and video distribution platforms, online literature databases, and online gaming.
- In 2016, China's new Counter-Terrorism Law required Internet and telecommunication companies and other providers of "critical information infrastructure" to store data on Chinese servers and to provide encryption keys to government authorities.⁷⁹ Any movement of data offshore must undergo a "security assessment."
- In 2016, China enacted a new cybersecurity law that forces a broad range of companies to store users' personal information and other important business data in China.⁸⁰
- In March 2016, China enacted new regulations regarding cloud-computing services in China that essentially exclude foreign technology firms and reinforce local data-storage requirements.⁸¹
- In April 2017, China released a draft circular that outlined extensive localization requirements—both explicit and implicit—as part of a restrictive regime of "security checks" for businesses wanting to transfer data overseas, further to the cybersecurity law, which outlined the need for such security assessments. This draft extends data localization from "critical information infrastructure" to all "network operators," which is likely any owner or administrator of a computerized information network system. Furthermore, any outbound data transfer would be prohibited if it brings risks to the security of the national political system, economy, science and technology or national defense."⁸²

ENDNOTES

1. OECD Glossary of Statistical Terms website, access March 14, 2018, <https://stats.oecd.org/glossary/detail.asp?ID=3295>.
2. World Trade Organization, *Working Party on Domestic Regulation: Regulatory Issues in Sectors and Modes of Supply: Note by the Secretariat*, (Geneva: World Trade Organization, April 30, 2013), https://docs.wto.org/dol2fe/Pages/FE_Search/DDFDocuments/116468/q/S/WPDR/W48A1.pdf.
3. World Trade Organization, *World Trade Report 2012: Trade and public policies: a closer look at non-tariff measures in the 21st century* (Geneva: World Trade Organization, 2012), https://www.wto.org/english/res_e/booksp_e/anrep_e/world_trade_report12_e.pdf.
4. For a review of studies, see Michelle A. Wein and Stephen J. Ezell, “How to Craft an Innovation Maximizing T-TIP Agreement” (Information Technology and Innovation Foundation, October 2013), <http://www2.itif.org/2013-innovation-maximizing-ttip-agreement.pdf>.
5. Organisation for Economic Cooperation and Development (OECD), *OECD Services Trade Restrictiveness Index*, (Paris: OECD, 2014), <https://www.oecd.org/mcm/MCM-2014-STRI-Policy-Brief.pdf>.
6. Organisation for Economic Cooperation and Development (OECD), *OECD Services Trade Restrictiveness Index: Policy Trends Up to 2018* (Paris: OECD, January, 2018), <http://www.oecd.org/trade/services-trade/STRI-Policy-trends-up-to-2018.pdf>.
7. OECD, “Entrepreneurship at a Glance” (table 2.2; table 2.6 [percent]; accessed April 4, 2014), accessed March 8, 2016, www.oecdilibrary.org/sites/entrepreneur_aag-2013-en/02/02/index.html.
8. Countries not included are Denmark, Ireland, France, Sweden, Portugal, Romania, Hungary, Italy, Cyprus Eurostat. Structural Business Statistics (SMEs—annual enterprise statistics by size class), accessed March 7, 2016, <http://ec.europa.eu/eurostat/web/structural-business-statistics/structural-businessstatistics/sme>.
9. Bloom, Nicholas, Raffaella Sadun, and John Van Reenen. 2012. “Americans Do IT Better: US Multinationals and the Productivity Miracle.” *American Economic Review* 102 (1): 167–201.
10. Cardona, M., Tobias Kretschmer, and Thomas Strobel. 2013. “ICT and Productivity: Conclusions from the Empirical Literature.” *Information Economics and Policy* 25 (3): 109–25. This paper provides a survey of recent microeconomic studies estimating the relationship between the use of digital technologies and firm productivity growth.
11. See: Phillipe Aghion, Griffith Blundell, Peter Howitt, and S. Prantl, “The Effects of Entry on Incumbent Innovation and Productivity,” *Review of Economics and Statistics* 91 no. 1, (2009): 20–32; Phillipe Aghion, Robin Burgess, Stephen J. Redding, and Fabrizio Zilibotti. “Entry Liberalization and Inequality in Industrial Performance,” *Journal of the European Economic Association*, 3 (2/3) (2006): 291–302; Phillipe Aghion Christopher Harris, Peter Howitt, and John Vickers, “Competition, Imitation and Growth with Step-by-Step Innovation,” *Review of Economic Studies*, 68 (3) (2001): 467–92; and Paolo Buccirossi, Lorenzo Ciari, Tomaso Duso, Giancarlo Spagnolo, and Cristiana Vitale, “Competition Policy and Productivity Growth: An Empirical Assessment,” *Review of Economics and Statistics*, 95 (4) (2013): 1324–36.
12. United States International Trade Commission (USITC), *Global Trade 1: market Opportunities and Key Foreign Trade Restrictions* (Washington D.C.: USITC, August, 2017), https://www.usitc.gov/publications/332/pub4716_0.pdf.

-
13. Nigel Cory, "Cross-Border Data Flows: Where Are the Barriers, and What Do They Cost? (Information Technology and Innovation Foundation, May, 2017), <https://itif.org/publications/2017/05/01/cross-border-data-flows-where-are-barriers-and-what-do-they-cost>.
 14. Accenture, "Digital Fragmentation' Poses Threat to Businesses' Global Growth and Innovation According to Accenture Report," press release, accessed March 14, 2018, <https://newsroom.accenture.com/news/digital-fragmentation-poses-threat-to-businesses-global-growth-and-innovation-according-to-accenture-report.htm>.
 15. Cory, "Cross-Border Data Flows: Where Are the Barriers, and What Do They Cost?"
 16. Jelle Frank van der Zwet, "Cracking latency in the Cloud," *Datacenter Dynamics*, January 8, 2015, <http://www.datacenterdynamics.com/content-tracks/colo-cloud/cracking-latency-in-the-cloud/72505.fullarticle>.
 17. "Chinese tech companies plan to steal American cloud firms' thunder," *Economist*, January 18, 2018, <https://www.economist.com/news/business/21735043-alibaba-aims-matching-or-surpassing-amazon-web-services-2019-chinese-tech-companies-plan>.
 18. United States International Trade Commission (USITC), *Global Trade 1: market Opportunities and Key Foreign Trade Restrictions*.
 19. United States Trade Representative, *The 2016 National Trade Estimate report* (Washington, D.C.: United States Trade Representative), <https://ustr.gov/sites/default/files/2016-NTE-Report-FINAL.pdf>.
 20. Barbara Li, "China's New Telecom Catalogue Comes Into Force on March 1, 2016," *Norton Rose Fulbright*, February 2016, <http://www.nortonrosefulbright.com/knowledge/publications/137503/chinas-new-telecom-catalogue-comes-into-force-on-march-1-2016>; Jacob Parker, "US-China Business Council Comments on the Draft Cybersecurity Law" (The US-China Business Council, August 4, 2016), https://www.uschina.org/sites/default/files/USCBC%20Comments%20on%20Cybersecurity%20Law_EN.pdf.
 21. World Trade Organization Council for Trade in Services, "Computer and Related Services Background Note by the Secretariat S/C/W/45" (Geneva: World Trade Organization, July 14, 1998), https://www.wto.org/english/tratop_e/serv_e/w45.doc.
 22. Stephen J. Ezell and Robert D. Atkinson, "False Promises: The Yawning Gap between China's WTO Commitments and Practices" (Information Technology and Innovation Foundation, September 2015), <http://www2.itif.org/2015-false-promises-china.pdf>.
 23. United States Trade Representative, "2013 National Trade Estimate China" (Washington, DC: United States Trade Representative, 2014), <https://ustr.gov/sites/default/files/2013%20NTE%20China%20Final.pdf>; Hogan Lovells, "Third Party Payment Licenses in China - Are They Within the Grasp of Foreign Investors?" (London: Hogan Lovells, June 2014), http://www.hoganlovells.com/files/Uploads/Documents/14.06_Corporate_China_Alert_-_Third_Party_Payment_Licences_in_China_-_Are_They_within_The_Grasp_of_Foreign_Investors_SHALIB01_1093411.pdf.
 24. IBM, "Made in IBM Labs: IBM to Build First Cloud Computing Center in China," news release, February 1, 2008, <http://www-03.ibm.com/press/us/en/pressrelease/23426.wss>; Rebecca Blumenstein, "Microsoft's Partner Strategy in China," *The Wall Street Journal*, June 8, 2016, <http://www.wsj.com/articles/microsofts-partner-strategy-in-china-1465421401>; SAP, "SAP and China Telecom Expand Strategic Partnership to Provide SAP Cloud Portfolio in China," news release, November 20, 2013, <http://news.sap.com/sap-and-china-telecom-expand-strategic-partnership-to-provide-sap-cloud-portfolio-in-china/>.
 25. Leigh Ann Ragland et al., "Red Cloud Rising: Cloud Computing in China" (Washington, DC: U.S. Economic and Security Commission, September 5, 2013),

-
- http://origin.www.uscc.gov/sites/default/files/Research/DGI_Red%20Cloud%20Rising_2014.pdf; United States Information Technology Office (USITO), “USITO Brief: Ministry of Science and Technology 12th Five Year Plan” (Washington, DC: USITO, August 5, 2011), <http://www.semiconductors.org/clientuploads/directory/DocumentSIA/USITO%20Brief%20Ministry%20of%20Science%20and%20Technology%2012th%20Five%20Year%20Plan.pdf>.
26. United States International Trade Commission (USITC), *Global Trade 1: market Opportunities and Key Foreign Trade Restrictions*.
 27. Ksenia Koroleva, “Yarovaya’ Law—New Data Retention Obligations for Telecom Providers and Arrangers in Russia,” *Latham and Watkins Global Privacy and Security Compliance Law Blog*, July 29, 2016, <http://www.globalprivacyblog.com/privacy/yarovaya-law-new-data-retention-obligations-for-telecom-providers-and-arrangers-in-russia/>.
 28. “New Russian Legislation on Massive Telecoms Surveillance,” *Jones Day Publications*, July 2016, <http://www.jonesday.com/new-russian-legislation-on-massive-telecoms-surveillance-07-12-2016/>.
 29. Nigel Cory, “The Worst Innovation Mercantilist Policies of 2015” (Information Technology and Innovation Foundation, January 2016), <http://www2.itif.org/2016-worst-innovation-mercantilists.pdf>.
 30. Russia’s Ministry of Telecommunications, “Processing and storage of personal data in the Russian Federation. Changes since September 1, 2015,” website, accessed March 14, 2018, <http://minsvyaz.ru/en/personaldata/>.
 31. Max Smolaks, “Russian Government Will Force Companies To Store Citizen Data Locally,” *TechWeek Europe*, July 4, 2014, <http://www.techweekeurope.co.uk/workspace/russian-government-will-force-companies-store-citizen-data-locally-148560>.
 32. “Russia to check Twitter compliance with data law,” *Reuters*, November 27, 2017, <https://www.reuters.com/article/us-twitter-russia/russia-to-check-twitter-compliance-with-data-law-idUSKBN1DR0X6>.
 33. “Roskomnadzor: Facebook to stop working in Russia in 2018 unless complies with personal data localization law,” *Interfax-Ukraine*, September 26, 2017, <https://www.kyivpost.com/russia/roskomnadzor-facebook-stop-working-russia-2018-unless-complies-personal-data-localization-law.html>.
 34. Ingrid Lunden, “Russia says ‘nyet,’ continues LinkedIn block after it refuses to store data in Russia,” *TechCrunch*, March 7, 2017, <https://beta.techcrunch.com/2017/03/07/russia-says-nyet-continues-linkedin-block-after-it-refuses-to-store-data-in-russia/>.
 35. “Use of Public Cloud Services by Russian Financial Services Institutions (November 2017, ENG),” Pierstone website, accessed March 14, 2018, https://pierstone.com/use-of-public-cloud-services-by-russian-financial-services-institutions-fs/#_ftn11.
 36. Laura Mills, “New Russian Data Laws Worry Rights Activists, Telecom Companies,” *The Wall Street Journal*, July 7, 2016, <http://www.wsj.com/articles/new-russian-data-laws-worry-rights-activists-telecom-companies-1467905452>.
 37. Ibid.
 38. Matthias Bauer, Hosuk Lee-Makiyama, and Erik van der Marel, “Data Localisation in Russia: A Self-Imposed Sanction” (European Centre for International Political Economy, June, 2015), <http://ecipe.org/publications/data-localisation-russia-self-imposed-sanction/>.
 39. United Nations Statistics Division, *New issues requiring guidance in the Central Product Classification* (New York: United Nations, May, 2015), <https://unstats.un.org/unsd/class/intercop/expertgroup/2015/AC289-20.PDF>.

-
40. Shin-yi Peng, "GATS and the Over-the-Top Services: A Legal Outlook," *Journal of World Trade* 50, no. 1 (2016): 21-46.
 41. Shannon Bond, "HBO joins Netflix in shattering subscription records," *Financial Times*, February 1, 2018, <https://www.ft.com/content/c6191822-075e-11e8-9650-9c0ad2d7c5b5>; Reinhardt Krause, "Netflix Takes On Media Giants As Video Streaming War Goes Global," *Investor's Business Daily*, March 8, 2018, <https://www.investors.com/research/industry-snapshot/netflix-fights-media-giants-in-global-video-streaming-war/>.
 42. Krause, "Netflix Takes On Media Giants As Video Streaming War Goes Global."
 43. Austen Hufford, "Netflix Continues Landing Customers, Even After Increasing Prices," *WSJ*, January 22, 2018, <https://www.wsj.com/articles/netflix-continues-landing-customers-even-after-increasing-prices-1516656786>.
 44. Anabela Horbuz, "ANCINE issues VOD regulation recommendations," *Nextv News*, May 19, 2017, <http://nextvnews.com/ancine-issues-vod-regulation-recommendations/>; Juan Fernandez Gonzalez, "Brazil Continues VOD regulation debate," *RAPIDTVNews*, May 18, 2017, <https://www.rapidtvnews.com/2017051847250/brazil-continues-vod-regulation-debate.html#axzz50bWz5ovC>; ANCINE, (Portuguese) "Report of Public Consultations from the Regulatory Notice on Audiovisual Communications on Demand and Recommendations of ANCINE" (regulatory report, ANCINE, 2017), http://convergecom.com.br/wp-content/uploads/2017/05/Relatorio_Ancine_VoD.pdf.
 45. Juan Fernandez Gonzalez, "Brazil Continues VOD regulation debate."
 46. Paulo Higa, (from Portuguese) "ANCINE to create a tax for Netflix and quota for national films," *tecnoblog*, December, 2015, <https://tecnoblog.net/192787/netflix-imposto-cota-producao-nacional-ancine/>; "LAW N° 12.485, OF SEPTEMBER 12, 2011," website of the Presidency of Brazil's Civil House, Sub-Office for Legal Affairs, accessed December 14, 2017, http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2011/Lei/L12485.htm.
 47. Juan Fernandez Gonzalez, "Brazil's creators demand VOD regulation," *RAPIDTVNews*, July 5, 2016, <https://www.rapidtvnews.com/2016070543482/brazil-s-creators-demand-vod-regulation.html#axzz4lPHvBsY>.
 48. "Brazilian cinema agency suggests VoD regulation," *telecompaper*, November 2, 2017, <https://www.telecompaper.com/news/brazilian-cinema-agency-suggests-vod-regulation--1218709>.
 49. "Taxation on OTT in Brazil," *TechinBrazil*, June 10, 2015, <https://techinbrazil.com/taxation-on-ott-in-brazil>.
 50. Ricardo Feltrin, (from Portuguese) "Government plans to charge R\$300 million in fees from Netflix Brazil until 2022," *UOL*, March 3, 2017, <https://tvefamosos.uol.com.br/noticias/ooops/2017/03/01/governo-cogita-cobrar-r-300-milhoes-em-taxas-da-netflix-brasil-em-5-anos.htm>.
 51. "Half of Internet Users in Brazil Watch VOD," *eMarketer*, August 23, 2016, <https://www.emarketer.com/Article/Half-of-Internet-Users-Brazil-Watch-VOD/1014384>.
 52. "YouTube, Netflix Find Massive VOD Success in Brazil," *eMarketer*, September 2, 2016, <https://www.emarketer.com/Article/YouTube-Netflix-Find-Massive-VOD-Success-Brazil/1014435>.
 53. Tendências Consultoria Integrada, "The Economic Impact of Brazil's Audiovisual Industry" (report prepared by consultants, October 2016), http://www.mpaamericalatina.org/wp-content/uploads/2015/12/MPAAL_10_04_2016-english-fv.pdf.
 54. Tendências Consultoria Integrada, "The Economic Impact of Brazil's Audiovisual Industry"
 55. Nelson de Sa, (from Portuguese) "Netflix President remembers stumbling blocks and comments on competition with channels," *Folha de Sao Paulo*, January 10, 2016,

-
- <http://www1.folha.uol.com.br/ilustrada/2016/10/1818877-presidente-da-netflix-lembra-tropecos-e-comentaria-concorrenca-com-canais.shtml>.
56. Juan Fernandez Gonzalez, "HBO ramps up Brazilian production," *RAPIDTVNews*, March 11, 2017, <https://www.rapidtvnews.com/2017031146475/hbo-ramps-up-brazilian-production.html>. #axzz50bWz5ovC
 57. "Government Regulation No. 82 of 2012 on Electronic Transactions and Systems Operators (GR 82)," website accessed December 14, 2017, https://chambermaster.blob.core.windows.net/userfiles/UserFiles/chambers/9078/File/ICT/2017/OTT_Public_Hearing/ApplicationandContentServiceMinisterRegulationDraftFinal002.pdf; Nigel Cory, "Worst Innovation Mercantilist Policies of 2016."
 58. Nigel Cory, "Worst Innovation Mercantilist Policies of 2016."
 59. "Government Regulation No. 82 of 2012 on Electronic Transactions and Systems Operators (GR 82)."
 60. Nick Redfearn, "Online Businesses and tax in Indonesia," Rouse the Magazine website, June 19, 2017, <https://www.rouse.com/magazine/news/online-businesses-and-tax-in-indonesia/>.
 61. Organization for Economic Cooperation and Development (OECD), *Tax Challenges of Digitalisation* (Paris: OECD, October 25, 2017), <https://www.oecd.org/tax/beps/tax-challenges-digitalisation-part-2-comments-on-request-for-input-2017.pdf>.
 62. Federal Law No. 87-FZ of May 1, 2017. "New Regulation of Online Cinemas in Russia," Debevoise and Plimpton law firm website, accessed December 14, 2017, https://www.debevoise.com/-/media/files/insights/publications/2017/05/20170531en_new_regulation_of_online_cinemas_in_russia.pdf.
 63. Vladimir Kozlov, "Netflix Continues Operating in Russia Despite Foreign Ownership Restrictions," *Hollywood Reporter*, July 3, 2017, <https://www.hollywoodreporter.com/news/netflix-continues-operating-russia-foreign-ownership-restrictions-1015525>.
 64. J'son & Partners Consulting, "The Russian Legal On-Demand Video Services Market" (report done for the European Audiovisual Observatory, 2017), http://www.obs.coe.int/documents/205595/552774/RU+2017+The_Russian_Legal_On-Demand_Video_Services_Market-Report_J_sonAndPartners_EN.pdf. /f0f0705f-4bf3-48b3-bd64-ce9d79d63235.
 65. J'son & Partners Consulting, "The Russian Legal On-Demand Video Services Market."
 66. J'son & Partners Consulting, "The Russian Legal On-Demand Video Services Market."
 67. Erik Gruenwedel, "Report: Netflix, Amazon Prime Video Projected to Leave Russia," *Home Media Magazine*, September 11, 2017, <http://www.homemediamagazine.com/streaming/report-netflix-amazon-prime-video-projected-leave-russia-40763>.
 68. J'son & Partners Consulting, "The Russian Legal On-Demand Video Services Market."
 69. Vladimir Kozlov, "Why Russia's Foreign Ownership Restrictions on Streamers Do Not Affect Netflix," *Hollywood Reporter*, August 31, 2017, <https://www.hollywoodreporter.com/news/netflix-exempt-russias-foreign-ownership-restrictions-1034219>.
 70. Vladimir Kozlov, "Netflix Continues Operating in Russia Despite Foreign Ownership Restrictions."
 71. Stephen J. Ezell, Robert D. Atkinson, and Michelle A. Wein, *Localization Barriers to Trade: Threat to the Global Innovation Economy* (Information Technology and Innovation Foundation, September, 2013), <http://www2.itif.org/2013-localization-barriers-to-trade.pdf>.

-
72. Timothy Stratford and Yan Luo, “3 Ways Cybersecurity Law in China Is About to Change,” *Law360*, May 2, 2016, <https://www.law360.com/articles/791505/3-ways-cybersecurity-law-in-china-is-about-to-change>.
 73. “Notice of the People's Bank of China on Urging Banking Financial Institutions to Do a Good Job in Protecting Personal Financial Information,” People’s Bank of China, January 21, 2011, <http://www.lawinfochina.com/display.aspx?lib=law&id=8837&CGid=>.
 74. Regulation on the Credit Reporting Industry, State Council 228th session, China (2013), <http://www.pbccrc.org.cn/crc/jgyhfw/201309/1ca0f775b50744cabaf83538288d77a9/files/e8a8bf080ed64f48914a652da1d8fdc3.pdf>.
 75. “Interpretation on Population Health Information Management Measures (Trial Implementation),” National Health and Family Planning Commission of the PRC, last updated June 15, 2014, http://en.nhfpc.gov.cn/2014-06/15/c_46801_2.htm.
 76. Michael Martina, “Concern over China insurance rules ahead of talks with U.S.,” *Reuters*, May 31, 2016, <http://www.reuters.com/article/us-china-cyber-insurance-idUSKCN0YM0NN>.
 77. Ron Cheng, “Latest Developments on China’s Cybersecurity Regulation,” *Forbes*, June 30, 2016, <https://www.forbes.com/sites/roncheng/2016/06/30/latest-developments-on-chinas-cybersecurity-regulation/#7658dc6c3165>.
 78. “Online Publishing Service Management Rules,” China Copyright and Media website, last accessed March 23, 2017, <https://chinacopyrightandmedia.wordpress.com/2016/02/04/online-publishing-service-management-rules/>.
 79. “Protecting Data Flows in the US-China Bilateral Investment Treaty” (AmCham China, April, 2015), <http://www.amchamchina.org/policy-advocacy/policy-spotlight/data-localization>.
 80. Nigel Cory, “The Worst Innovation Mercantilist Policies of 2016” (Information Technology and Innovation Foundation, January 2017), <http://www2.itif.org/2017-worst-innovation-mercantilist-policies.pdf>.
 81. *Ibid.*
 82. “China Publishes Draft Measures for Security Assessments of Data Transfers,” Hunton and Williams, April 11, 2017, <https://www.huntonprivacyblog.com/2017/04/11/china-publishes-draft-measures-security-assessments-data-transfers/>; Translated: “Circular of the State Internet Information Office on the Public Consultation on the Measures for the Assessment of Personal Information and Important Data Exit Security (Draft for Soliciting Opinions),” China Copyright and Media, April 11, 2017, <https://chinacopyrightandmedia.wordpress.com/2017/04/11/circular-of-the-state-internet-information-office-on-the-public-consultation-on-the-measures-for-the-assessment-of-personal-information-and-important-data-exit-security-draft-for-soliciting-opinions/>.