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The TPP and the digital trade agenda: Digital industrial policy and Silicon Valley's influence on new trade agreements

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Abstract

The global economy is undergoing a digital shift that is likely to intensify with rapid growth in digital trade and digital-based restructuring of economic sectors. While trade in “traditional” goods and services is subject to enforceable rules through multiple agreements, key areas relevant to the digital economy are weakly regulated. This has provided policy space for latecomer economies to implement what we call digital industrial policy. Through denying market access, data localization, and technology transfers, some of the digital industrial policy tools represent a threat to US firms that dominated the digital world and to the position of the US economy as a global digital leader. Consequently, underpinned by growing political power of Silicon Valley, the US adopted the “digital trade agenda” in its trade policy particularly in the so-called 21st century trade agreements; the TPP and TTIP. This trade agenda is likely to expand in the future and will have important implications on digital and economic development.

Keywords: Digital industrial policy, Trans-pacific partnership, data localization, the digital trade agenda, Silicon Valley, digital catching-up

1 - Introduction

“The Trans-Pacific Partnership (TPP) is the most ambitious and visionary Internet trade agreement ever attempted”

The United States Trade Representative (USTR) Office, 2015

“We have owned the Internet. Our companies have created it, expanded it, perfected it in ways that they can’t compete. And oftentimes what is portrayed as high-minded positions on issues sometimes is just designed to carve out some of their commercial interests”

Barack Obama on EU investigations of US Tech companies over privacy and data protection, 2015

While the liberalization of trade in “traditional” goods and services has passed through different phases throughout long periods of human history, trade in digital goods and services has been “born global” with few barriers imposed on the flow of digital goods and services and the cross-border data flows that facilitate digital trade. The ease and low cost of real-time global data flows have played a revolutionary role in the global economy. It has revolutionized the production and trade of existing goods and services and created new geographies of production and trade through facilitating outsourcing processes and enabling real-time integration of global supply chains. It has also led to the emergence of new economic sectors and new products and services that are directly driven by the internet.

While the role of nation states in regulating and controlling flows of physical goods and services is the cornerstone of the international political economy of trade, the role of nation states in controlling and shaping global data flows and digital trade is less understood. For goods and services, nation states use different types of policy tools to shape these flows including infrastructure, tariff barriers, non-tariff barriers, regional trade blocs, preferential trade agreements, and various other policies. These policies aim to shape the type of flows a country is integrated into, who are the key partners of these flows, and also how to maximize the economic and social benefits of these flows to the country. While many of these policies have been conducted at a national level, the post-WWII period witnessed a shift towards a global level of governance. This was initially limited to the issue of tariffs on goods, but with the creation of the World Trade Organization (WTO) in 1995, this global regulatory framework expanded substantially to include trade in services and other “trade-

related” issues such as intellectual property rights (IPRs) and investment measures. In addition, this new expanded system was underpinned by a strong dispute settlement mechanism.

The picture is, however, very different when it comes to global flows of data and digital trade. Despite the rapid expansion of these flows and the rapid integration of new locations in the map of global digital data flows, the role of regulatory frameworks in governing this remains less developed. Benefitting from this “policy space”, a number of countries are unilaterally implementing policies that are having major impacts on digital trade and data flows in a number of areas relevant to the digital economy (including cross-border data flows, data localization requirements, mandatory technology transfers, encryption, censorship and filtering, amongst other areas). While these policies are often analyzed from political or security perspectives, many of these policies have economic and technological motives as they promote technological catching-up and provide space for local digital firms to grow and learn. Internet filtering, for instance, is often analyzed as a political or freedom of speech issue, but it can also be used to restrict market access to specific firms that allows other (often local) firms to dominate the domestic market. The “Great Firewall of China”, for instance, that blocks market access to a large number of Western firms, was an important factor in the emergence of Chinese digital firms such as Ali Baba, Baidu, Tencent, and TaoBao who are rapidly catching-up with their American competitors and challenging these firms in a number of digital sectors. We refer to such policies as “digital industrial policy” – the range of attempts at a national level to shape digital flows in order to influence trade and affect national “digital catch-up”. Such approaches are being used by a growing number of nations and are crucial to understand not only from the relatively narrow perspective of the internet sector and directly-related activities, but more importantly when considering how digital tools and solutions are becoming central in most sectors of the economy.

For established digital and ICT firms with leading technological advantage in the field, digital industrial policies represent a major threat to their global position, particularly US firms that have dominated the digital world since its inception. Such policies can block their access to rapidly-growing markets, force them to transfer specific knowledge and technology, or to invest in locations they would not invest in otherwise. Such policies also represent a long-term threat to the US economy which has a strong comparative advantage in the digital

economy and related activities which gives it a strong advantage to lead the major technological shifts in the coming decades in different economic sectors. As a result, US firms and policy makers have been leading actors in pushing for new enforceable international rules on digital trade and data flows, driven by the importance of the industry to the US economy and the growing political influence of leading digital firms over the last few years. The limited progress in incorporating these issues in the institutions of the WTO has led US trade policy makers to incorporate this “digital trade agenda” into the new mega-trade agreements the US is currently negotiating, particularly the Trans-Pacific Partnership (TPP) and the Transatlantic Trade and Investment Partnership (TTIP) (Meltzer 2015). These trade agreements, often referred to as the “21st century trade agreements”, are not only important in regulating trade with partner countries, who account for a huge share of global trade and GDP, but also have the potential to re-shape the multilateral trade framework in the future. This digital trade agenda, we argue, is likely to expand in the coming decades.

This paper focusses on the drivers behind the inclusion of the digital trade agenda in these mega-trade agreements, and the implications of this on digital industrial policy and technological catching-up. The rest of the paper is organized as follows. Section two explored the evolution of trade and the frameworks used to understand the key actors and power. Drawing on these frameworks, section three discusses the growing political role of ICT firms and how this is being reflected in incorporating the “digital trade agenda” in new international trade agreements such as the TPP. Section four provides a critical discussion of the implications of this technological development and catching up. Section five concludes.

2 - The Political Role of Business Firms and Interest Groups in Driving International Trade Agreements

The political economy of international agreements and trade regimes has received substantial attention in the last few decades. While initially such efforts were seen in a positive “international cooperation” framework, theoretical work that started from the 1980s began to examine the political motives behind such agreements. Drawing on game theory concepts, explanations highlighted the role of international cooperation through tacit cooperation, formal bilateral and multilateral cooperation, and the creation of international regimes as a way to achieve common goals between states in a world of no central authority (Oye 1986, Keohane 1984, Martin 1999).

Underlining the difficulty in reaching a consensus on highly distributive issues, this literature highlighted the role of state power in driving specific outcomes in this process. More powerful states are capable of imposing their own preferences on weaker states leading to international rules and norms that reflect the interests of the more powerful states, with market size seen as a key source of power in international trade regimes (Martin 1999, Krasner 1991). Why would smaller countries participate in such economic regimes that reflect the interests of the more powerful countries? From this perspective, weaker countries are effectively forced to join the international regimes designed by more powerful countries driven by the potential loss of market access (Steinberg 2002, Gruber 2000). The more powerful countries often trigger this process by adopting a “competitive liberalization” strategy in which they offer other countries the opportunity to join such agreements. This creates a dynamic in which the weaker country faces a choice of potentially losing market access, particularly if competing exporting countries join such trade agreements themselves. This dynamic creates a race to membership that leads to the expansion of such agreements (Shadlen 2008).

Consequently, the question is what are the drivers behind the behavior of those powerful states in international trade negotiations. Multilateral or bilateral trade liberalization results in significant redistributive outcomes in different partners and creates winners and losers within national economies between different economic sectors and different social groups. Understanding the drivers of trade policy is crucial to understand the political economy of

redistribution that is a key part of these trade agreements. Different bodies of literature in political science and economics deal with this question and offer different explanations for the drivers behind trade policy preferences. Contrary to the work that see trade policy formulation mainly driven by welfare-maximizing government policy, an important body of literature has focused on the role of lobbying as an important factor in shaping trade policy through political mobilization, campaign contributions, lobbying activities, in addition to indirect sources of power (Grossman and Helpman 1994, Grossman and Helpman 2002, Beaulieu & Magee 2004). Indeed, it has been observed that international trade policy is an area where the gap between policymaker choices and the prescriptions of economists is the largest, compared to other fields of economic policy (Rodrik 1995).

While the initial focus was on lobbying by national firms and interest groups, later research has highlighted the active participation of foreign firms and interest groups in this (Gawande et al. 2006). As a key to drive the post-war international trade regime, a special focus in this literature has been in explaining the role of political mobilization of firms and interest groups in shaping US trade policy. Asking if “trade policy is for sale”, Baldwin and Magee (2000), found that campaign contributions and presidential favors were significant factors in determining how US legislators voted on NAFTA and the GATT. Building on that, Conconi et al. (2012) explored the role of term length of legislators in their voting patterns on trade issues. Beyond legislators, interest groups also influence trade by shaping the policies of the United States Trade Representative (USTR) - the USTR being the key actor in trade negotiations (Kaminski 2014, Moberg 2014). Thus, international trade policy can be seen as a reflection of political economy factors as politicians and their key internal supporters use international trade policy to lock-in their political power in international rules that are difficult to change by subsequent governments (Nzelibe 2011).

The two factors outlined above - the dominance of powerful countries in global trade, and the role of interest groups in shaping the policies – have been illustrated in a number of international trade regimes. One of the best illustrative cases was the trade-related intellectual property rights (TRIPs) agreement that was signed as part of the Uruguay Round and the establishing of the WTO. The TRIPs represented a huge change to the international regulatory framework on IPRs and had significant impact on developing countries in particular. The inclusion of IPRs was initially opposed by a number of developing countries,

but the US and the EU effectively forced these countries to accept the agreement through adopting the “single undertaking” approach to the deal (Steinberg 2002). The persistence of the US and the EU to incorporate IPRs in the trade deal was driven by a number of factors especially fears of loss of competitiveness in the 1980s and the transnational private sector mobilization that supported the inclusion of the issue of IPRs in the deal (Sell 2003).

However, recent negotiations have proven to be more difficult and powerful countries have found it more difficult to enforce their preferences. The explanations for this ranged from the institutional design of the WTO (one country one vote), the growing economic power of emerging markets such as China, India, and Brazil, to issues related to the negotiation process (Odell 2009). As illustrated by the failure of several rounds of negotiations in the context of the Doha Round, introducing new issues into multilateral framework has proven to be difficult. In this context, the US started promoting regional and bilateral trade agreements that often exchanged policy space for industrial policy with improved market access (Shadlen 2005). Most recently, the US trade policy moved into promoting mega-trade agreements that are often called “21st Century trade agreement”. This included the Trans-Pacific Partnership (TPP) which include twelve Asia-Pacific countries and the Trans-Atlantic Trade and Investment Partnership (TTIP) between the US and the EU¹. These agreements, it can be argued, create pressure on developing countries to accept the demands of the developed countries in the WTO or to lose their market access to other countries that accept the new rules of these agreements. The implementation of one of those agreements, or both, will have huge ramifications on the global economy. The TPP is likely to have substantial ramifications on the Asia-Pacific region and to launch a process of competitive pressure to on non-member states to join the trading bloc. Non-member countries particularly those that have substantial exports to the US are likely to come under strong pressure from their exporters to join the bloc. For instance, a number of countries in Asia such as Thailand and the Philippines have expressed overall interest in the TPP but are still hesitant with opposition from different groups in the country. The membership of other countries in the region, however, can change their calculations as these countries attract more investments and increase their exports. An example of this is the Philippines. Over the

¹ At the time of writing, the TPP has been signed and is in the process of ratification. The negotiations of TTIP are ongoing with a draft due for release before the end of the Obama presidency.

last few years, the Philippines has been very active politically in an attempt to secure preferential market access to the US market in textile and garments through a proposed programme called “SAVE our industries Act”. The Filipino textile and garments industry was highly active in pushing for this trade programme. Nonetheless, this political campaign failed to succeed and the act was not adopted in the US with suggestions that the US preference will be for the Philippines to join a broader trade agenda through the TPP instead of being granted a narrow preference programme (De Vera 2013). Meanwhile, Vietnam (one of the countries inside the TPP bloc) is already attracting growing investments in the same sector and is expected to experience a sharp increase in exports following the implementation of the agreement (World Bank 2016). Such dynamics are likely to increase the pressure on countries in the position of the Philippines to eventually join the TPP.

In sum, the political economy perspective outlined in this section orientates the rest of the paper. We assume, like previous agreements that these new mega-trade deals reflect the perspectives of dominant countries, notably the US, where in turn US agendas reflect overall economic interests in addition to the position and mobilization of key firms and interest groups. These political economy perspectives provide a framework to explore ICT firms and new trade agreements in subsequent sections, and to build a picture of the winners and losers as digital trade becomes governed within international agreements.

3 - Digital Firms, Political Mobilization, and Twenty first century trade Agreements

Over the last few years, the importance of digital trade and global data flows in the global economy has increased substantially. From 2005 until 2015, the number of internet users has increased from around one billion users to more than three billion users (World Bank 2015). This included a very rapid increase in the number of internet users from emerging markets especially from countries like China, Brazil, and India. Further growth in access to the internet is expected especially from emerging countries where the penetration rate (internet users as percentage of population) remains lower. China, for instance, still have a penetration rate below 50% while Brazil has a penetration rate of 53% compared to around 85-90% for the developed countries. As a result, trade in digitally-delivered goods and services is increasing rapidly and growth is expected to continue as more products and services become tradeable digitally and as more consumers are connected to the internet. At the same time, digital technology is revolutionizing sectors that are often seen as “traditional” manufacturing and agricultural sectors. The competition for the future of the automotive industry today, for instance, is about automated production, data-driven transportation and self-driving models of car sharing and ownership - with companies like Google and Uber playing a key role in this effort (Fung & Tsukayama 2005). Similar digitalization processes can be seen in a wide range of manufacturing, agriculture, and services sectors and are likely to intensify in the coming years (Foster & Graham 2015).

3.1. - Tensions in governance of digital trade and global data flows

The growth in digital trade and global data flows is creating tensions with the multilateral trading regime governing trade in goods and services globally particularly the WTO rules. Digital trade was acknowledged in the WTO framework in 1995² but little reform has been subsequently made as digital trade has evolved with the rise of the internet and the more active role of governments (Wunsch-Vincent & Hold 2011). While detailing the specific issues is beyond the scope of this paper (see Vincent & Hold 2011, Meltzer 2015), we outline two key areas of tensions that have emerged. The first is the enforcement of WTO rules

² A work programme on e-commerce was created in 1995 and called upon countries to “continue their current practice of not imposing customs duties on electronic transmissions”

related to imposing tariffs or barriers on digitally-trade goods and services³. The second is tensions around cross-border data flows⁴.

Such tensions have been brought to the fore by the growing use of so-called “digital protectionism” in a number of countries. This is particularly occurring in large emerging markets such as China and Brazil who have imposed or are considering a number of measures that limit free digital trade. In such cases, firms and nations have struggled for recourse through WTO institutions. While the space for national industrial policy has been narrowed substantially through the WTO and a range of regional and bilateral trade agreements (RBTAs), the space for digital industrial policy remain significantly larger. This includes policies that are often spoken of in the mainstream press as driven by political or security concerns. Filtering of websites, for instance, is not only a restriction on free speech, but also is effectively a restriction of market access to specific foreign firms. The rise of digital industry policy with the absence of strong multilateral rules represents a key threat to US firms in the digital industry, the firms that led the early technology development in the field and still maintain the technological advantage in it. According to a study by the United States Trade Representative (USTR), the US had a net a surplus of US\$ 135.5 billion in digitally-deliverable services in 2011, with digitally-deliverable services accounting for more than 60 percent of US service exports and about 17 percent of overall US goods and services exports. The largest two markets for the US in digitally-deliverable services, according to the study, were Europe and Asia/Pacific. In a testimony on “commercial espionage and barriers to digital trade in China”, Matt Schruers, the vice president for industry group the Computer & Communications Industry Association (CCIA) highlights the threat for US firms:

It bears noting that while these strategies are practiced within China, they are also practiced by other nations as well, with the result being that U.S. services are allowed uneven and unequal access to numerous growing markets abroad.....As a result, Internet services — one of the fastest growing areas of U.S. exports — face one of the most hostile market landscapes abroad.

³ Issues include the applicability of general GATS rules and specific commitments to the electronic delivery, classification of electronically-traded services, how to deal with new services that cannot easily be classified under existing GATS commitments

⁴ Issues include rules on data localization, and censorship.

In addition to the direct market access issue, growth of digital industrial policy also represents a threat to the position of the US economy and the position of US firms in driving the shifts to the digital economy in the coming decades. The digitalization of the economy might offer an opportunity for US firms in different industries to reclaim a global position they might have lost in the last few decades by collaborating with US digital firms as the growing linkages between automotive firms such as GM and Ford and Silicon Valley firms suggest; linkages that some competitors in other countries might find more difficult to build (Fung & Tsukayama 2005, Williams 2016). With the failure to incorporate new rules for digital data in multilateral trading frameworks, there has been a push to incorporate these rules in bilateral and regional trade agreements (Meltzer 2015). Most notably the new mega-trade agreements such as the TPP and TTIP have received a particular focus as they have the potential to re-shape multilateral trading rules. This was also driven by the growing political influence of the digital industry particularly in the US.

3.2. - The Growing Political Power of the ICT and Digital Industry

Over the last few years, the political role of ICT companies has increased substantially with some of these firms becoming key political lobbying forces⁵. In the US, political spending by these firms - including lobbying, campaign contributions, and other forms of political activism - have increased substantially over the last few years making internet and new “tech” companies one of the strongest lobbying sectors in Washington (table 1). This included major spending from large companies such as Google, Facebook, Amazon, Yahoo, Apple, EBay, Microsoft, and Apple, but also younger firms such as Snapchat, Rapidshare, LinkedIn, Dropbox, Twitter, Airbnb, Expedia, in addition to industry associations (details in table 2). Larger firm have become amongst the top spenders on political lobbying of any firms as outlined in Figure 1.

Company	2010	2011	2012	2013	2014
Google	5.2	9.7	18.2	15.8	16.8
Facebook	0.35	1.35	3.8	6.4	9.4
Amazon	2	2.2	2.5	3.46	4.94
Microsoft	6.9	7.33	8.1	10.5	8.3

⁵ Indeed, not only in the US, where many of these companies are located, but also in the EU and other jurisdictions

Intel	3.68	4.52	4.77	5.6	4.8
Apple	1.6	2.3	1.98	3.4	4.1
Yahoo	2.2	2.5	2.75	2.8	2.9
Netflix	0.1	0.5	1	1.2	1.3
EMC Corp	1.46	1.55	3	2.11	2.33
Salesforce	0.09	0.11	0.42	0.44	0.44
EBay	1.7	1.6	1.6	2.2	1.6
Expedia	1.9	1.2	1.3	1.4	0.9
BSA	2.07	1.82	1.62	1.34	1.52
CTA	1.9	2.91	2.83	3.45	3.2
SIIA	0.52	0.88	0.88	1.08	1.24
Internet Assn	-	-	-	1.6	1.53
ITI	2.56	1.08	1.08	1.08	1.08
Others ⁶	0.65	1.1	2.13	2.31	3.22
Total	34.53	42.65	57.96	66.17	69.6

Table 1: Lobbying Spending by ICT Firms and industry associations
Source: Data from the Centre for Responsive Politics

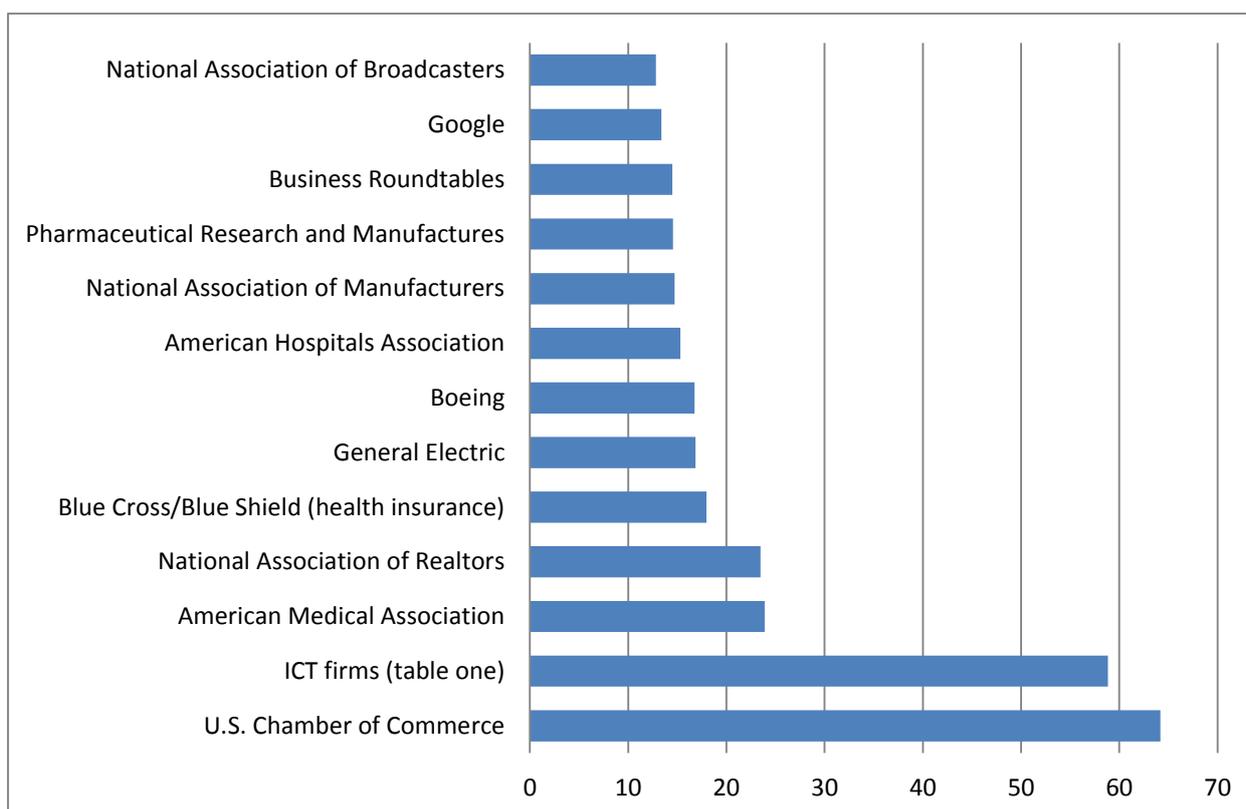


Figure 1: Lobbying spending by ICT firms compared to top spenders, 2015, US\$ million, Source: Data from the Centre for Responsive Politics

⁶ This includes Snapchat, Rapidshare, LinkedIn, Dropbox, Twitter, Airbnb, Travelport, Yelp, Uber, Ali Baba, and Rackspace.

Association	Details	Key Members
The Business Software Alliance (BSA)	An internationally-oriented trade organization of digital firms headquartered in Washington, DC with operations in more than sixty countries	Apple, Adobe, Microsoft, and Dell
The Internet Association	An association for internet firms	Airbnb, Amazon, Dropbox, Facebook, Google, ETSY, Reddit, Twitter, TripAdvisor, Uber, Yahoo,
Information Technology Industry Council (ITI)	An industry association of the high-tech sectors	Apple, Adobe, EMC, Facebook, Google, Intel, HTC, Microsoft, Samsung, Sony, Twitter, Yahoo
The Software & Information Industry Association (SIIA)	A trade association representing the software and the digital content industry	Apple, Facebook, and Google
Consumer Technology Association (CTA)	Formerly known as the Consumer Electronics Association (CEA), the CTA represents around 2,200 mostly American but also global firms in different technology-related areas including start-ups, small, and large firms	Apple, Google, Amazon, and Microsoft, Uber, Airbnb, Expedia, and Adobe
The Silicon Valley Leadership Group	Represents around 400 companies in the digital industry and social media sector	Facebook, Google, Apple, and Microsoft
Technet	A network of CEOs and Senior Executives of leading companies in information technology, ecommerce, Internet, social media and apps, biotechnology, clean energy and venture capital/finance.	Amazon, Apple, Facebook, Accenture, Google, Yahoo, Microsoft, Oracle

Table 2: Industry associations and alliances for the US digital sector

As well as lobbying and industry associations, the industry is very active in providing campaign contributions to both US political parties, including congressional and presidential candidates. Key industry players were highly supportive of Barack Obama two presidential campaigns.⁷ Throughout his two terms as a president, Obama was a strong supporter of the industry. The Washington Post highlighted the revolving door between the Obama Administration and high-tech firms arguing that “history may view Obama as the first tech president” (Kang and Eilperin 2015). Much of the focus in the wider press have been on how these companies has been exerting political influence in internal US policy, but they are also

⁷ Data by the Centre for Responsive Politics. The money does not come directly from the companies but from individual member, employees, owners, or through Political Action Committees (PACs).

increasingly active in other key political agenda, with many of these companies increasing their lobbying on international issues and trade.

3.3. - Digital Trade and Data Flows in Twenty-First Century Trade Agreements

One of the areas in which this growing political role of the digital industry can be seen is the area of international trade. While many of these firms and industry associations have been active in the area of IPR, copyright and piracy for a relatively long time, their role in lobbying to incorporate the issues of digital trade and data flows in trade agreements have increased in recent years. This was underpinned by the argument outlined previously, that digital industrial policy is on the rise in many countries and negatively affecting US digital firms, and the US economy which has a competitive advantage in the sector.

In 2012, the Business Software Alliance (BSA) published a report titled: “Lockout: How a New Wave of trade Protectionism Is Spreading through the World’s Fastest-Growing IT Markets — and What to Do about It”. The report highlighted measures that affect digital trade and suggested that eliminating these barriers should become key “agenda items in bilateral, multilateral, and regional trade”. At the time the report called for updating the WTO framework to better resolve some of the tensions outlined in previous sections. By 2015, the BSA published a second report titled: “Powering the Digital Economy: A Trade Agenda to Drive Growth”. The report highlighted the rapid growth in digital trade and proposed a new “digital trade agenda” that focus on trade rules to enable digital commerce, ensure data can flow across borders with few restrictions, provide robust intellectual property rights, promote market-led globally adopted technology standards, open up government procurement, and expand the information technology agreement of the WTO. In 2015, the ITI organized a session in the WTO Public Forum meetings in Geneva to bring the issue of digital trade to the discussion and similarly highlighted the need to

“consider drafting new rules to prevent discriminatory behavior by governments that can prohibit or constrain flows of digital trade”.

Similar arguments have also been made by influential firms. For example a position paper by Google titled “Enabling Trade in the Era of Information Technologies: Breaking Down Barriers to the Free Flow of Information” concluded that:

Today, this engine of economic growth [the internet] is increasingly coming under attack by government policies that restrict the free flow of information online...

First, governments should not treat Internet policy and international trade as stand-alone silos, and recognize that many Internet censorship-related actions are unfair trade barriers.

Second, governments should object to measures that affect information flow and that are insufficiently transparent, unreasonably administered, biased in favor of domestic players..

Third, governments should negotiate new trade disciplines that reflect the growing role of Internet-related trade in the global economy...

New trade agreements such as TTIP and TPP were supported by influential actors in the digital industry as a way to bring the digital trade agenda into the core of US trade policy. In its 2015 report, the BSA argued that the ongoing negotiations (TPP, TTIP, Trade in Services Agreement, and the Information Technology Agreement) “together represent a critical opportunity to advance such a modernization effort”. Similarly, the Internet Association expressed support to the new agreements demanding that they meets the needs of the industry in regard to digital trade and copyrights and that they “eliminates impediments to the development of cloud computing infrastructures, such as prohibitions on cross-border data flows, data storage taxes, or data localization requirements”. The ITI listed “advancing the Trans-Pacific Partnership negotiations” as one of its key trade priorities promoting tech-friendly outcomes of the negotiations that would include “greater regulatory transparency, stronger intellectual property rights enforcement, binding provisions to support the cross-border flow of data, and light-touch approaches to encryption regulation”. The Silicon Valley Leadership Group also lobbied for the TPP and the trade promotion authority. In February 2015, a joint statement by industry associations to democrat and republican senate and house members stated that the “trade agreements currently being negotiated represent a tremendous opportunity to open new markets for our industry and set the rules for the 21st century digital economy...We need a gold standard framework for global trade that is reflective of today’s digital economy and the growing importance of the technology and Internet sectors”. A number of digital and ICT firms and industry associations are also members in the U.S. Coalition for TPP, an industry-wide business organization supporting the TPP. Following the signing of TPP and before its ratification, Technet issued a statement

to endorse the agreements and urge the Congress to ratify it. In the endorsement, the president and CEO of TechNet, Linda Moore, argued that:

The U.S. technology sector has grown into a leading force in the US economy...The statistics are staggering: the U.S. innovation economy now supports more than 30 percent of U.S. GDP and employs more than 6.5 million Americans. It's being driven by the incredible new technologies developed in Silicon Valley, Seattle, Austin, Boston, and beyond, and it's been accelerated by international trade...

Yet, our nation's ability to continue to lead in this sector is dependent on access to the fastest growing markets in the world and the uninhibited flow of data across borders...This agreement supports U.S. technology leadership around the globe, and will drive economic growth and job creation here at home.

In addition to the role of industry associations, individual companies also lobbied for issues related to digital trade. As table 3 shows, lobbying disclosures in the US show that companies like Google, Facebook, Amazon, Microsoft, Yahoo, lobbied different government bodies on a range of issues linked to digital trade and digital policy.

Company	Lobbying Issues
Google	trade preferences extension act of 2015, trade promotion authority (TPA), Trans-pacific partnership (TPP), safe harbour, free flow of information, international internet governance, trans-Atlantic trade and investment partnership (TTIP), data localization, cybersecurity, data privacy, Panama free trade agreement, Colombia free trade agreement, Korea free trade agreement
Facebook	Free trade agreements, data localization, cross-border trade flows, digital trade, trade promotion authority (TPA), encryption issues
Amazon	Cross-border data flows, free trade agreements, trans-Atlantic trade and investment partnership (TTIP), internet governance, trade promotion authority (TPA), bilateral trade agreements
Microsoft	Trade promotion authority (TPA), Trans-pacific partnership (TPP), trans-Atlantic trade and investment partnership (TTIP), implementation of FTAs with Korea, Panama, and Colombia, and the inclusion of provisions of interest to the high-tech industry including IPR, competition, and market access in new agreements, African Growth and Opportunity Act (AGOA), internet governance, cloud computing, cybersecurity,
BSA	Korea-US FTA, trade promotion authority (TPA), Trans-pacific partnership (TPP), trans-Atlantic trade and investment partnership (TTIP), Information technology agreement (ITA), IPRs, cybersecurity, electronic commerce, government procurement
Apple	Trans-pacific partnership (TPP), Information technology agreement (ITA), trade promotion authority (TPA), standards and technical barriers to trade, free trade agreements
Yahoo	Issue related to trade and the competitiveness of the internet sector, Trans-pacific partnership (TPP), cross-border data flows, IPRs in trade agreements,
SIIA	International trade issues, privacy and data security, cloud computing, cross-border data flows, barriers to digital trade, localization requirements, encryption

	regulations, trade relations with China, China indigenous innovation policies, IPRs, Trans-pacific partnership (TPP), trans-Atlantic trade and investment partnership (TTIP), Information technology agreement (ITA),
CTA	General trade issues, bilateral trade agreements, Trans-pacific partnership (TPP), trade promotion authority (TPA), Information technology agreement (ITA), small business ability to export, FTAs with Colombia, Panama, Peru, and South Korea, trade relations with China
Salesforce	Digital trade, cross-border data flows, Trans-pacific partnership (TPP), trade promotion authority (TPA), trans-Atlantic trade and investment partnership (TTIP), cloud computing, privacy, cybersecurity
EMC Corp	International trade issues, cloud computing, big data, data security

Table 3: Trade Issues on which ICT firms Lobbied

Source: The Lobbying Disclosure Act Database

The growing importance of digital trade, the threat to the US dominance, and the individual and collective efforts by digital firms have led to the adoption of this agenda as a key element of the US trade policy in recent years and in ongoing trade negotiations. In 2014, President Obama nominated Robert Holleyman to the position of Deputy US Trade Representative. Prior to this, Holleyman was an industry lobbyist and had been the CEO of the BSA for thirteen years. In his nomination hearing, Holleyman highlighted the importance of this issue:

I share the imperative of ensuring that the U.S. trade policy be at the forefront of leading and establishing the rules of the road for digital trade.

...I know quite well that the rules of the road in trade that the U.S. helped negotiate over the past 20 years have been essential in allowing U.S. innovators to succeed globally as they have under existing trade regimes, but those rules, while a good foundation, do not fully contemplate the type of barriers that we are now seeing to digital trade.

...That makes it all the more important for this committee, Congress, and the administration to be driving a digital trade agenda. I intend to pursue that vigorously to ensure that in the next 20 years, the next 40 years, that American entrepreneurs and workers have the same opportunities to succeed as they have had in the past. That means things like ensuring that there are cross-border data transfers, ensuring that we have provisions against forced localization, ensuring that there is not a discrimination against digital products, and ensuring that there is the legal certainty so that businesses know how to operate in this environment.

In a later speech in 2015, Holleyman argued:

I am speaking today about the digital economy and trade as a 21st century leadership imperative, because we stand at a cross road. The rules we have in place in the international trading system—historically championed by the U.S. I will add—have served us well, so far. They have helped enable the explosive growth of

the Internet and dissemination of new technology, have led to rapid changes that have brought us closer together, allowed us to trade across borders, and have allowed some of the world's greatest innovations to emanate from our shores. However, as someone who has worked at the intersection of technology and international trade for over two decades, I can speak with confidence when I say this: the trading rules that have helped us get to where we are today are no longer sufficient. They are no longer sufficient in light of the seismic changes in the way that technology is evolving. They are no longer sufficient in the face of new barriers that are being erected. Barriers that if allowed to proliferate will stand in the way of innovation and impede the ability for U.S. innovators to succeed in the digital future as they have in the digital past.

Many of the policies demanded by the industry were reflected in the US trade policy and in the “digital dozen” principles adopted by the USTR.⁸ Similarly, the trade promotion authority (TPA) which was granted to Obama by the Congress in 2015, listed digital trade and cross-border data flows as principle negotiating objectives of the United States. They demanded that current obligations, rules, disciplines, and commitments under the World Trade Organization and bilateral and regional trade agreements apply to digital trade in goods and services and to cross-border data flows, that electronically delivered goods and services receive no less favorable treatment under trade rules and commitments than like products delivered in physical form, and that that governments refrain from implementing trade related measures that impede digital trade in goods and services, restrict cross-border data flows, or require local storage or processing of data. In a policy statement, the SIIA argued that the trade promotion authority (TPA) “is crucial for finalizing agreements that will set the template for 21st Century trade and for protecting the global digital leadership of the United States”. “With enactment of this legislation”, the statement continued “it will be the official U.S. trade negotiating position that governments must refrain from measures that impede digital trade, restrict cross-border data flows, or require local storage or processing of data”. The 2011 FTA with Korea was the first agreement to include a clause on cross-border data flows (article 15.8). The Trans-Pacific Partnership (TPP) agreement

⁸ These include: prohibition on duties for digital products, non-discrimination principles on digital trade, measures to stop partners from forcing companies to localize their computing services, prohibiting trading partners from requiring companies to purchase and utilize local technology, provisions to safeguard network competition). See “the digital dozen” brochure issued by the Office of the United States Trade Representative (USTR) or the Remarks by Deputy U.S. Trade Representative Robert Holleyman to the New Democrat Network on May 1, 2015.

expanded this by incorporating some of the key issues the industry had been demanding. In particular, chapter fourteen of the agreement on electronic commerce deals with these issues. The chapter highlights the importance of electronic commerce and avoiding unnecessary barriers to its use and development which are outlined in table 4 below.

Article	Details
14.2	<ul style="list-style-type: none"> • Service delivered electronically are subject to the obligations contained in chapters on investments, trade in services, and financial services
14.3	<ul style="list-style-type: none"> • No custom duties on electronic transmissions and electronically-transmitted content
14.6	<ul style="list-style-type: none"> • Members recognize the legal validity of electronic authentication and electronic signatures
14.4	<ul style="list-style-type: none"> • Non-discriminatory treatment of digital products between the TPP partners (except broadcasting)
14.11	<ul style="list-style-type: none"> • Allow cross-border transfers of information for the conduct of the business (including personal information)
14.13	<ul style="list-style-type: none"> • Bans data localization requirements
14.7	<ul style="list-style-type: none"> • Bans countries from requesting the transfer or the access to the source code of software • Applies to mass market software with an exception for software used for “critical infrastructure”
14.9	<ul style="list-style-type: none"> • Members to make trade administration documents available in electronic form and accept that documents submitted electronically as the legal equivalent of the paper version
14.16	<ul style="list-style-type: none"> • Cooperation on cybersecurity between TPP countries
18.82	<ul style="list-style-type: none"> • Increased responsibility on internet service providers (ISPs) with regard to IPR including the liability to pay damages to copyright holder
ANNEX 8-B	<ul style="list-style-type: none"> • Bans requirement to transfer or provide access to particular technology, production process, a private key, or other secret parameter, algorithm specification or other design detail, that is proprietary to the manufacturer or supplier and relates to the cryptography in the product, to the Party or a person in the Party’s territory • Other than where the manufacture, sale, distribution, import or use of the product is by or for a government of a member country • This clause does not prevent law enforcement from requiring service suppliers using encryption they control from providing, pursuant to legal procedures, unencrypted communications.

Table 4: Selected clauses included in the TPP relating to digital data and data flows

These issues, we argue, are likely to expand in the future. Speaking about the TPP⁹, Holleyman underlined that the US proposed an “adaptable platform” to ensure that “new and innovative digital products and services are protected from discrimination and other

⁹ Remarks by Deputy U.S. Trade Representative Robert Holleyman to the New Democrat Network on May 1, 2015.

barriers". "The upshot of this approach", he argued, "is that the services and investment commitments we negotiate will extend to entirely new business models and services that emerge, unless a specific negotiated exception applies". This will have important implications for digital industrial policy and digital catching-up.

4 - The Implications of the New Digital Trade Agenda for Economic Development, digital industrial policy, and Catching-up

In this section, we outline the implications that such rules might have on the ability for latecomer firms and nations to adopt technologies, learn and innovate. There is an extensive literature on catch-up process from firms and nations in the global economy which has highlighted important paths by which latecomer firms, even with low skills and resources are able to leverage technologies to upgrade and become involved in hi-tech production, as attested to by the success of East Asian economies (Hobday 2005, Mathews 2002, Mathews & Cho 2000). There is still work to be done to explore in detail what extent ‘catch up’ notions are applicable to digital trade. Nevertheless, we argue that there is evidence that such models are applicable to digital data, and that new trade deals could limit the ability of such nations to ‘catch-up’.

Much of the publicity around digital trade barriers has focused on them as a barrier to an open internet: linked censorship and filtering and often equated with political control, censorship or preserving moral standards of nations (Schmidt & Cohen 2013). Less has been said about how implementation of such barriers can at least partially be attributed to spurring innovation and local industries. Such economic objectives are sometimes overt - for example a report from the umbrella group of the Computer & Communications Industry Association (CCIA) highlights “digital trade barriers” in diverse countries, a number of which one might consider to have an economic agenda (such as China, Russia, Nigeria, France and Germany) (CCIA 2015). Elsewhere, such agendas are less overt. For example one cannot doubt that China’s Great firewall is a key approach that enables the Chinese state to censor information to its citizens. Yet, as we will outline in the next section, commentators and indeed Chinese policymakers have identified that this filtering has been as effective of supporting local industries as it has in blocking politically sensitive information for internet users (Johnson 2010, Liu 2010). Below we illustrate some of the potential implications that the inclusion of digital trade in global agreements could have. We particularly focus on in terms of two controversial areas – market access and free data flows, and data localization.

4.1. - Market Access, Free data flows and technological development

Erecting barriers which prevent access and cross-border flows of data can provide potential for local firms to grow without early competition from mature international firms, and as such resembles approaches for nurturing infant industries in the digital sector. One much publicized example is China's restrictions on access to a large number of websites (Facebook, Twitter, YouTube, Instagram, Dropbox, amongst others), often referred to as the "great firewall of China", and while often seen as a censorship issue is also an economic issue. This economic case has been most vividly shown in the rapid rise of Chinese web-giants - such as Ali Baba and TaoBao (e-commerce sites), Weibo (Twitter-like service), Baidu (Search engine), and Tencent (social networking)- which are directly attributable to these policies (Chen 2015). These companies are increasingly active in a range of digital-based activities and in some cases competing head-to-head with US lead firms. Ali Baba, for instance, is heavily investing in cloud computing and aiming for global expansion in this area (Carsten & Ruwitch 2015, Wang 2015). In 2015, Baidu entered a partnership with BMW to develop driverless cars (Williams 2015). Baidu is also active in research on image and speech recognition technologies, robotics, predictive analytics, big data through its Big Data Lab, Institute of Deep Learning, both in Beijing, and also through a \$300 million research and development center in Silicon Valley (Mozur & Winkler 2014). Tencent was ranked as number 12 in 2015 Boston Consulting Group's (BCG) most innovative companies' survey.

China also often links market access to foreign firms with these companies entering joint ventures and partnerships with local firms. The Chinese movie market, for instance, is growing rapidly and there is a strong competition for online streaming services in the market. A number of Chinese companies and joint ventures between Chinese and foreign companies are competing to expand in this market (Cookson 2016). This is taking place while some of the leading companies in other countries are struggling to enter the market due to government permissions. Announcing the expansion of Netflix to 130 countries and what he considered the "birth of a new global Internet TV network" (Maan & Tharakan 2016), the chief executive of Netflix Reed Hastings explained why China was not of the new countries:

With China, you really want to build relationships first, before you get to the practical parts of building a business... And so we are doing that now and getting to

know people, both in government and in partner companies...We'll just keep working on the relationships...We are very patient. Whether it is 2016, 2017, we'll just keep working on it

Such measure have caused frustration for US firms who find themselves sidelined in potentially lucrative markets, for example Google has regularly voiced its frustration having been forced out of the Chinese market “when governments choose to manipulate the market in favor of local firms, it is naturally harder for foreign firms to compete” (Google 2010 p.9). There has been talk of challenging firewall rules in the WTO for a number of years (Palmer 2010). However, as mentioned, WTO and GAT rules often provide unclear guidance – that have made effective litigation difficult (Liu 2010, Meltzer 2015).

A related factor in regard to technological development in China is how they have adopted a process moving ‘from imitation to innovation’, a path that industrial policy scholars have outlined in previous of generations of technology based development in East Asia (Kim 1997). A key approach taken in China has been technological transfer requirements on international firms in exchange for market access, including in some areas the transfer of source code as a condition to sell to the government or to gain the relevant licenses to trade in the country. Whilst such restrictions can serve security purposes, they also drive technology transfer by forcing the seller to disclose and transfer the technology of production. Reverse engineering has long been a key tool for technology transfer, and source requirements can accelerate this process (Hobday 2005). In line with catch-up models, Chinese firms have often begun by producing generic ‘clones’ of popular international web services, where source code can aid rapid introduction of services that are stable and accepted by local consumers. These resources are then slowly developed locally without competition (EFF 2015a).

An example of these technology transfer rules is the Chinese government regulations in 2015 that require that foreign companies that sell computer equipment to Chinese banks to transfer their source codes to the Chinese authorities. The same regulations also call for companies to establish research and development centers in China (Mozur 2015). Commenting on a decision by IBM to give the Chinese government access to some software code in 2015, Ray Wang, an analyst at Constellation Research, a Silicon Valley-based research firm, told Bloomberg Business that source code requirements ensure the

government are “.. comfortable that source code won’t kill their government, though there’s definitely a little bit of: ‘Can we reverse engineer this?’” (Cao 2015).

China tends to receives most attention due to its rapidly growing economy in addition to being one of the more muscular countries in dealing with free data flows. Nevertheless, these activities are not limited to China. In an interview with the Financial Times the US trade representative Michael Forman argued that the new digital rules of the TPP are (Donnan 2015):

“not only aimed at China...the TPP agreement would push back at digital protectionism that we see popping up all over the world”

As introduced in the previous section, TPP regulations defined under E-commerce looks to reduce such activities. TPP rules prohibit requirement of source code of software in contracts (EFF 2015b). Furthermore, TPP rules specifically mention non-discriminatory treatment in digital products, which looks to support better market access for international firms (Hansen & Slater 2015).

4.2. - Data localization

There is also a growth in activities in recent years emerging around forcing data localization or data sovereignty. We argue that in addition to issues around privacy and security, data localization regulations can be seen as a digital industrial policy that aims at either forcing trans-national firms to invest in a country, or to promote a national internet industry (Castro & McQuinn 2015).

From the perspective of globalized digital firms, freedom to freely locate data centers is important as it allows them to build a global network of data centers based on their business models. It enables cheap and quicker expansion into new market and economies of scale (Meltzer 2015). Data centers are highly capital-intensive and optimum location is based on geographic, economic and technical factors. Geographic location is important, particularly for firms involved in high intensity cloud computing, where firms will locate reasonably close to core customers (to limit delay from transatlantic round trips for data requests). Technically, firms need to easily link into core backbone networks, and given the high costs of air conditioning for servers, cooler climates are preferable (Rolander 2011). A stable political environment with low political risk is also important. IT firms increasingly

make location decisions according to electricity costs, sales tax and other subsidies (Burrington 2015a, Burrington 2015b). Figure 3 shows a map of the cloud computing data centers by three leading firms in the industry: Amazon Web services, Microsoft Azure, and Google. As can be seen, the infrastructure is concentrated in limited locations in mostly developed countries in the United States, Europe, Australia and Asia to serve those markets.



Figure 2: Cloud computing data centers (Amazon: Yellow, Google: blue, Microsoft: red), Source: websites of respective companies

To understand data localization rules implemented by some countries, it is important to highlight not only the direct investment benefits of hosting data centers, but also their wider economic and technological impacts. While some studies have highlighted the economic costs to countries of adopting “data localization” rules (Bauer et al. 2014), it is important to also consider the impact on catching-up rather than a narrow assessment of the direct impact on GDP. Investments in the sector has direct benefits to the economy in terms of FDI, skilled and relatively highly paid job opportunities, and taxes. But more broadly, developing a data industry is seen as an important part of the development of a digital industry. Investments by leading firms in a location signal that the location has a

stable and reliable business and political environment. It can also lead to virtuous circles of new data centers alongside connectivity, skilled staff which support clustering effects that can support the emergence of hi-tech capacity in nations. A 2013 study by the Washington Research Council found that data centers contribute to area in jobs, taxes, construction but also that it gives the area a “key advantage in the quest for technology-based economic development” (Washington Research Council, 2013). Similarly, a study by Boston Consulting Group (BCG) on the impact of Facebook data centers in Northern Sweden highlighted the direct and indirect contribution of the project to the local and national economy. It also reiterated the point that such investments provide the backbone of a building wider digital infrastructure and digital industry in Sweden.

With these benefits in mind, a number of locations have looked to attract data centers and cloud locations by offering attractive terms for digital firms to locate. Policy makers see such investments are a step in placing a country/location in a good position to contribute to the newer data-related economic sectors that will follow in coming decades. Ireland, for instance, has attracted investments in the digital industry for years and has become an important location for the software industry, the gaming industry, internet-related industries, and data industries (Kerr & Cawley 2012, Andreosso-O'Callaghan et al. 2015). From this position, Ireland is a strong position to move into the new digital economic activities. Ireland's investment strategy for 2015-19 issued by the Irish Industrial Development Agency (IDA) argues that the new waves of technology are creating new opportunities that Ireland is perfectly positioned to exploit highlighting areas such as big data, cloud computing, the internet of things, the sharing economy, and financial technology. A number of research centers have been established in Ireland on some of these issues often in collaboration between the industry, the government, and key national universities.

Data localization rules have become important with nations citing data security concerns which leads them to looking to store data and implement cloud computing hosted in-country (Meltzer 2015). There are certainly legitimate security reasons why countries would choose localization, particularly subsequent to the stories emerging from recent national security leaks. Nevertheless, nations are aware of the economic benefits of such data localization and a number of countries have implemented, or are considering data localization rules

(Polatin-Reuben & Wright 2014). Data localization rules could significantly affect the strategies of international IT, web and cloud companies and push them to invest in locations that they would not invest in otherwise. This is particularly relevant for large middle-income and developing countries that are increasingly an important market for digital trade and internet-based services and where negotiation for “data localization” could effectively be used as a bargaining tool in exchange for market access (Ezell et al. 2013).

The awareness of data and data localization as a national economic strategy has been recognized by a number of nations. This is illustrated in a recent China’s discussion paper on cloud computing entitled “Guiding Opinions on Cloud Computing for Promoting the Innovation and Development of Cloud Computing to Cultivate New Types of Information Industry Services”, or in France’s less successful attempt to promote local cloud computing through 'Le cloud souverain'. Both these policies look to use data localization as a way to drive local industries (CCIA 2015). The Chinese government have adopted the development of cloud industry and market as a key priority in the 12th five year plan in 2011 and implemented a number of policies to encourage the sector. These policies played an important role in the catching-up Chinese cloud providers have been able to make in the last few years (Khsetri 2015). Aliyun, the cloud computing arm of Ali Baba group, has benefitted from this to capture a large share of the Chinese markets and to use this position as a starting point for global expansion (Carsten & Ruwitch 2015, Wang 2015).

In terms of data localization, new trade agreements looks to remove the possibility of such policy by expanding so-called data ‘Safe Harbour’ principals, the levelling out privacy laws across signatories, so that data privacy in one signatory country is equivalent to all others. Thus there is no longer a privacy justification for data localization rules.¹⁰ Further, in the TPP e-commerce, rules specifically place a priority of trade over privacy that shift the balance toward commercial concerns. The USTR summary of the TPP states that the agreement “includes guarantees that companies will not have to build expensive and unnecessarily redundant data centers in every market they seek to serve. The economies of scale of the digital economy, where capital and energy-intensive data centers serve multiple countries, depend on this flexibility”.

¹⁰ Some government data is likely to be exempt from the new rules

In sum, enabling freedom of speech, censorship and data sovereignty, are elements of new trade agreements. But in some senses these are peripheral or coincidental to the goals of enforcing open trade for international ICT firms. The motivations behind involvement in trade policy are often to try to engineer a better position for them to reach new markets. Less is said about the economic implications of new trade deals. We suggest there is strong possibility that they are likely to inhibit the ability of late-coming countries to enhance digital sectors by following policies of catch up.

5 - Conclusions

The global economy is undergoing a digital shift that is changing key production and trade models. This process is likely to expand in the coming decades with rapid growth in digital trade and also with growing digital-based restructuring of “traditional” manufacturing, agriculture, and services sectors. While trade in “traditional” goods and services is subject to clear and strongly enforceable rules through multilateral, regional, and bilateral agreements, some of the key areas relevant to the digital economy are still weakly regulated. This, over the last few years, has provided more “policy space” to late-coming economies to implement what this paper called digital industrial policy to achieve technological catching-up with the advanced economies. A large number of policy tools including data localization requirements, internet filtering, and technology transfer conditions have been used to promote national digital firms and to allow them to catch-up with the leading firms in the field. China, in particular, has provided a case of digital catching-up through the extensive use of digital industrial policy which enabled Chinese giant internet firms to dominate the domestic market and to use this market as a platform for global expansion and to challenges the position of leading American firms in the field. With the growing importance of digital catching-up economically, more countries, including many advanced economies, might follow suit by implementing digital industrial policy.

As a result of these dynamics, US digital firms have launched a political effort to introduce a “digital trade agenda” that regulates the ability of governments to implement digital industrial policy. The growing political power of these firms, on the one hand, and the threat to the US technological advantage in the digital economy, on the other hand, have moved these issues to the core of the US trade policy. The “digital trade agenda” was adopted by the USTR as a key part of the US trade policy in future multilateral and bilateral agreements. This push consists of two elements. The first is to introduce the key elements of this agenda in the multilateral framework, the WTO, and the second is to incorporate these issues in other trade agreements. With little progress in WTO negotiations in the last few years, mega-trade agreements, particularly the TPP and the TTIP, represent an opportunity to push this agenda globally. The TPP, signed in 2015, is the first mega-trade agreement to include specific clauses on issues such as cross-border data flows and source code transfer requirements. This, we argue, is only the beginning of a growing importance of these issues

in future trade negotiations with growing pressure from digital firms to “discipline” the behavior of national governments in this area to reach a an enforceable international framework of rules in this field. As this paper has argued, this could hinder the ability of catching-up countries to implement digital industrial policy in the future. While the “north-south” divide is relatively easy to draw in many areas of the international trading system, the boundaries of this issue might be more blurry as many advanced economies in Europe and Asia can be seen as latecomers in the digital economy in comparison to leading US digital firms.

This opens up a broad agenda in this field that needs to be addressed in future research. First, we still need a better understanding of the specific tools that constitute digital industrial policy. This paper has outlined a broad understanding of the concept and examples of policies. We, however, need a more systemic understanding of this and of the key policies that can be used. China, in particular, represents an important case to analyze due to the extensive use of digital industrial policy in the country and to the success of the country in bridging the digital gap and in building national digital firms that are increasingly aiming to compete with leading US firms in the field. The specific cases of Chinese digital firms and the ways they are going about the process of catching-up are also important area to investigate further. Another important question is how applicable are such policies in other emerging and developing countries. China has a huge and rapidly-growing internet market which allows policy makers huge bargaining power with foreign firms in addition to a large market for local firms to build capacities and achieve economies of scale and use as a platform for global expansion. It also has a political system that allows the government to use internet filtering widely. The situation is very different in other developing and smaller countries where governments, rightly in our view, do not have the same ability to control the internet. What type of policies can these countries use to promote digital catching-up while protecting access and freedom of the internet is an important issue to consider. A key issue here is to understand the right balance of digital industrial policy in a way that does not isolate a country from the digital economy and digital development but allows it a stronger position in the digital economy and higher ability to control its position and its firms to grow and capture a higher share of value-addition. Another important area for future research is a more detailed analysis of the impacts of the new digital trade agenda on

the policy space for emerging and developing countries. This requires closer examination of the key elements of the digital trade agenda and how they impact digital development in emerging and developing countries.

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