Concluding a High-Standard, Innovation-Maximizing TPP Agreement

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While the TPP has the potential to be a model innovation maximizing trade agreement, it will only become so if it both includes and holds the nations that sign it to the very highest standards.

The final round of negotiations toward the Trans-Pacific Partnership (TPP) Agreement took place in October 2013. As the final ministerial meetings take place in December 2013, it is important to remember that the United States is doing the right thing in pursuing deeper economic and trade integration with key Asia-Pacific partners, but the effort will only be worth it if it concludes with an innovation-maximizing trade agreement that sets the standard for future trade deals into which the United States enters.

The TPP involves 12 Asia-Pacific region countries—Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, Vietnam, and the United States—that have voluntarily come together to deepen economic integration and collaboration across the Asia-Pacific region by crafting a comprehensive, high-standard free trade agreement. [1] The TPP seeks to represent a model free trade agreement that can serve as a platform for broader regional integration by holding the potential to enroll additional partner countries, as evidenced by the fact that Japan joined TPP negotiations just in the past year, with South Korea also voicing potential interest. [2] U.S. trade with this region is vitally important, as TPP-member countries account for 40 percent of U.S. trade, while Asia-Pacific Economic Cooperation (APEC) countries account for 63 percent of U.S. trade.[3]

But while the TPP has the potential to be a model innovation maximizing trade agreement, it will only become so if it both includes and holds the nations that sign it to the very highest standards, including those regarding intellectual property rights (IPR) protection; liberalized trade in services; transparency and openness in government procurement

practices; restrictions on preferential treatment toward state-owned enterprises (SOEs); elimination of a host of non-tariff barriers (NTBs), including barriers to foreign direct investment (FDI); and at least equal, if not greater, emphasis on enforcement as on market access.[4] If the TPP is to become more than just another trade agreement for countries to join and then proceed to ignore the parts they don't like, the countries participating must fully renounce mercantilist practices—such as discriminatory government procurement practices, standards and currency manipulation, imposition of NTBs, inadequate protection of IP rights, etc.—and truly open their economies to market-based trade.

As this report—which updates the August 2012 report *Ensuring the Trans-Pacific Partnership Becomes a Gold-Standard Trade Agreement* from the Information Technology and Innovation Foundation (ITIF)—documents, a number of significant outstanding issues remain to be negotiated and successfully concluded, especially those regarding IPR protection and enforcement and market access rights, before the TPP can become a true twenty-first century trade agreement. Moreover, the past year has seen only limited progress by TPP parties in removing trade barriers. For instance, five TPP parties remain on the Special 301 Watch or Priority Watch Lists, published by the United States Trade Representative (USTR), which identify countries that provide inadequate intellectual property rights protections, signaling that significant intellectual property protection issues persist among some TPP countries. Only three other TPP parties (besides the United States) have joined the Government Procurement Agreement (GPA). Significant barriers to foreign direct investment, especially in the telecommunications sector, remain in many TPP countries. In fact, a comparison of USTR's *2012* and *2013 National Trade Estimate Reports on Foreign Trade Barriers*—which document countries' significant barriers to trade, whether they are consistent or inconsistent with existing international trade rules—reveals some improvement over the past year but mostly the persistence of the majority of the previously documented trade barriers among would-be TPP partners.

Ultimately, it would be a mistake for the United States to enter into a sub-standard TPP that offers only weak IP protections or that permits countries to maintain mercantilist practices; doing so would in fact be worse than not joining the agreement.

While the United States has expressed urgency for completing the TPP, negotiators must continue to focus foremost on crafting an innovation-promoting agreement capable of tackling an array of pressing problems throughout Asia and the Pacific region, such as low productivity. Given the ramifications, both for the integration of the world's most economically dynamic region and for the trading system globally, the United States should seize the opportunity to do something new and groundbreaking with the TPP. It should develop an innovation-maximizing trade agreement, and ask that the countries that join it adhere to the very highest standards and thoroughly eschew mercantilist practices. Ultimately, it would be a mistake for the United States to enter into a sub-standard TPP that offers only weak IP protections or that permits countries to maintain their mercantilist practices; doing so would in fact be worse than not joining the agreement.

This report begins by reviewing the global trade framework that maximizes global innovation. It then examines several outstanding issues in the TPP negotiations as well as the state of performance of TPP parties regarding intellectual property protection, services trade liberalization, openness toward digital trade, openness to foreign direct investment and market access, open and transparent government procurement practices, non-preferential treatment of state-owned enterprises, and conventional tariff reductions.

Summary Policy Recommendations for the TPP Agreement:

- Eliminate all tariffs in trade on innovation industries.
- Require TPP member countries to join the World Trade Organization's Information Technology Agreement.
- Liberalize trade in innovative services, especially telecommunication services and audiovisual services.
- Prohibit the use of localization barriers to trade, such as data server localization, in digital trade.
- Commit to the unrestricted import, use, and sale of products with cryptographic capabilities in the commercial market.
- Outlaw the use of local content requirements.
- Lower all barriers to foreign direct investment.
- Require that TPP member countries join the World Trade Organization's Government Procurement Agreement.
- Clarify the scope and coverage of national treatment in the General Agreement on Tariffs and Trade (GATT), explicitly subjecting state-influenced entities to a robust national treatment obligation.
- Complete an overall strengthening of intellectual property protection.
- Enshrine 12 years of data exclusivity for biopharmaceutical products.
- Adopt a common definition for trade secrets: any information that has economic value (actual or potential), is not generally known to the public, and for which the trade secret owner has taken reasonable measures to keep private.

WHY IS INNOVATION SO IMPORTANT TO DRIVING GROWTH?

Innovation has become the central driver of national economic well-being and competitiveness—and this is why so many countries are engaged in what might be called "a race for global innovation advantage."[5] But what is innovation? The Organization for Economic Cooperation and Development (OECD) defines innovation as "the implementation of a new or significantly improved product (that is, a physical good or service), process, a new marketing method, or a new organizational method in business practices, workplace organization, or external relations."[6] The key point here is that innovation can be both technological and non-technological in nature. In fact, innovation comes in a multitude of forms, including products, services, production or business processes (for goods or services, respectively), organizational models, business models, and social innovations (innovation directed toward specific societal gains). Within these dimensions, innovation can arise at different points in the innovation process, including

conception, research and development (R&D), transfer (the shift of the "technology" to the production organization), production and deployment, or marketplace usage.[7]

As a result, in recent years, a growing number of economists have come to see that it is not so much accumulation of capital but rather innovation that drives countries' long-run economic growth.[8] As the OECD notes, "a driving factor for much of the economic growth and rise in living standards in the post-World War II era is the rapid advances in technology and innovation."[9] The U.S. Department of Commerce estimates that technological innovation has been responsible for as much as 75 percent of the growth in the American economy since World War II.[10] And in a seminal study of 98 developed and developing countries, economists Peter Klenow and Andrés Rodríguez-Clare found that up to 90 percent of per-capita income growth stems from innovation.[11]

Innovation also plays a central role in improving citizens' quality of life. Innovation has been and likely will continue to be indispensable to helping societies address difficult challenges, such as developing sustainable sources of food and energy, improving education, combating climate change, meeting the needs of growing and aging populations, and increasing incomes. As such, the most important goal of any trade agreement should be to maximize innovation.

In the TPP, maximizing innovation by innovation industries will depend on three factors: 1) ensuring the largest possible markets; 2) limiting non-market-based competition; and 3) ensuring strong IP protection.

THE NATURE OF INNOVATION INDUSTRIES

If innovation is the key to achieving global economic, environmental and health progress, a critical question arises: what are the attributes that make a particular industry "innovative"? First, innovation—the continual introduction or improvement of new or existing products, services, or processes—is central to the competitive success of innovation industries. To some extent all industries, even "traditional" industries, innovate. But true innovation industries are ones where the rapid and regular development of new processes, products or services—many of them disruptive in nature—is critical to their competitive advantage. For example, industries like biotechnology and semiconductors are innovation industries, as their success depends not on making the particular drug or semiconductor cheaper, but on inventing the next-generation one.

The second key component of innovation-based industries is that the marginal cost of selling the next product or service is significantly below the average cost. The digital content industry (e.g., software, movies, music, books, and video games) is perhaps the most extreme example of this. In some cases it can cost hundreds of millions of dollars to produce the first copy, but additional digital copies can be produced at virtually no cost. Broadband providers invest billions to build networks, where the marginal cost of transporting the next bit can be quite low. Even "atom-based" industries, like aerospace, can have declining marginal costs. For example, it took Boeing almost eight years of development work and an expenditure of over $15 billion before a single 787 Dreamliner was sold.[12] That $15 billion is built into the overhead of every 787 sold. Economists refer to this as increasing returns to scale. Yet, not all industries have this characteristic; a 2013 study by the European Commission of over 1,000 European companies found increasing returns to scale for high-tech firms, but decreasing returns to scale for low-tech ones.[13]

Finally, innovation industries depend more than other industries on intellectual property, particularly science and technology-based IP. For example, software depends on source code; life sciences on discoveries related to molecular compounds; aerospace upon materials and device discoveries; and the content industries on low levels of piracy. The same study of European firms found that, for non-high-tech mid- and large-size firms, the contribution of knowledge capital to success was less than physical capital, but for high-tech firms it was greater.[14]

As a result, for the TPP—as for the global trading system generally—to maximize innovation by innovation industries will require getting three key factors right: 1) ensuring the largest possible markets; 2) limiting non-market-based competition; and 3) ensuring strong IP protections. All three factors get to the core challenge for innovation industries: investment in innovation is uncertain and therefore higher-than-normal profits on the innovations that are actually successful are needed.

PROVISIONS TO EXPAND MARKET SIZE

For innovation industries with high fixed costs of design and development but lower marginal costs of production, larger markets are critical; they enable firms to cover those fixed costs so that 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 five, expanding their sales by a factor of four, their total costs increase by much less than a factor of four. 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.[15] The more sales, the more earnings that can be plowed back into generating more innovation. This is also why the 2013 European Commission study of European firms found that for high-tech firms, "their capacity for increasing the level of technological knowledge over time is dependent on their size: the larger the R&D investor, the higher its rate of technical progress."[16]

Thus, the TPP needs to enshrine policies that expand effective market size. These include eliminating tariffs, especially for innovation-based industries; curtailing non-tariff barriers; and lowering all barriers to foreign direct investment.

Tariff Reduction on Innovation Industries

The TPP should seek to comprehensively reduce—if not entirely eliminate—traditional tariff barriers. Because the TPP will be a free trade area similar to the North American Free Trade Agreement (NAFTA), under WTO rules, for example, TPP members are allowed to fully eliminate tariffs between themselves while still maintaining Most Favored Nation (MFN) status for all other WTO members. Thus, the goal should be to entirely eliminate tariffs on goods traded within the TPP.

However, the MFN status of TPP participants provides a good indicator of where these countries stand with regard to this tariff elimination, because it shows how each country is currently treating its trading partners. And, as Table 1 shows, some TPP parties have seen progress in reducing their overall mean applied tariff rates. From 2010 to 2011, MFN applied tariff rates came down by 0.7 percentage points in Mexico, 1.7 percentage points in

Peru and 0.1 percentage points in New Zealand, a positive trend that needs to continue. Nevertheless, MFN applied tariffs increased by 0.9 percentage points in Japan and 0.8 percentage points in Canada. In addition, MFN applied tariffs remain quite high in countries such as Vietnam, Mexico, and Malaysia, which have MFN applied tariffs of 9.8 percent, 8.3 percent, and 6.5 percent, respectively.

TPP Party	MFN Applied Tariff (%), 2010	MFN Applied Tariff (%), 2011	Change by Actual Tariff
Vietnam	9.8	9.8	-
Mexico	9.0	8.3	-0.7
Malaysia	6.5	6.5	-
Chile	6.0	6.0	-
Peru	5.4	3.7	-1.7
Japan	4.4	5.3	0.9
Canada	3.7	4.5	0.8
United States	3.5	3.5	-
Australia	2.8	2.8	-
Brunei	2.5	2.5	-
New Zealand	2.1	2.0	-0.1
Singapore	0	0	-
TPP Member Average	**4.6**	**4.6**	**-0.1**

Table 1: MFN Applied Tariff Rates, 2011[17]

However, as across-the-board tariff elimination will most likely be difficult, the priority should be to remove tariffs on innovation industries. The reason is that tariffs on non-innovation industries, like apparel or lumber, usually simply require consumers of these products to pay more (while helping taxpayers generally). But tariffs on innovation industries (e.g., semiconductors) hurt not just the consumers of these products, but also the producers by reducing global market size, balkanizing production, and reducing revenues for reinvestment back into the next round of innovation.

Moreover, by rising costs on key capital goods industries (e.g., information and communications technologies, or ICTs), tariffs reduce use of these key innovation and productivity-enabling technologies. Such high tariffs on advanced technology products only serve to damage these economies, causing other sectors to suffer. For example, for every $1 of tariffs India imposed on imported ICT products, it suffered an economic loss of $1.30 due to spillover effects.[18] As Kaushik and Singh found with regard to their study of ICT adoption in India, high tariffs did not create a competitive domestic [hardware] industry, but they did limit adoption of ICT in India by keeping prices high.[19] In other words, tariffs are particularly pernicious when applied to ICTs, hurting the nations that impose them by raising the cost of ICT goods and services, thus causing businesses (and individuals) to invest less in ICT, lowering their productivity.

For instance, Brunei imposes tariffs of 20 percent on printed circuit boards; Malaysia places tariffs of 25 percent on computer monitors; and Vietnam imposes tariffs of 14 percent on televisions, digital cameras, and video cameras.[20] Thus, it is imperative that enabling free, market-based trade in ICT products and services be a core tenet of the Trans-Pacific Partnership Agreement. Table 2 shows the statuses of TPP parties in the World Trade Organization's Information Technology Agreement (ITA), a novel trade agreement in which participating nations completely removed tariffs on eight categories of ICT products (including semiconductors, computers, and telecommunications equipment). Nine of the 12 TPP parties are signatories to the agreement. Only Brunei, Chile, and Mexico are non-signatories to the ITA.

Signatories	Non-Signatories
Australia	Brunei
Canada	Chile
Japan	Mexico
Malaysia	
New Zealand	
Peru	
Singapore	
United States	
Vietnam	

Table 2: TPP Parties' Participation in the WTO's Information Technology Agreement[21]

Membership in the Information Technology Agreement—and participation in ongoing negotiations to expand the ITA—should be a condition of membership in the TPP.

The ITA has been one of the most successful trade agreements ever undertaken.[22] As ITIF documented in *Boosting Exports, Jobs, and Economic Growth by Expanding the ITA*, since the ITA's launch in 1996 there has been a tremendous disparity in the growth of ICT product and services exports between ITA-member countries and non-ITA-member countries. As the report notes, "While ITA membership does not guarantee that a country will be a strong ICT exporter, it does appear to be associated with stronger ICT exports."[23] In addition, ITIF writes in *The Benefits of the ITA for Developing Countries* that the ITA has been at least as big of a win for developing countries as it has been for developed ones.[24] For these reasons, membership in the Information Technology Agreement—and participation in ongoing negotiations to expand the ITA—should be a condition of membership in the TPP. Vietnam is the only country among the nine current would-be TPP member signatories to the ITA that is not participating in negotiations to expand the scope of ICT products covered by the Agreement.[25]

Non-tariff Barrier Restrictions

While countries worldwide have made progress in reducing tariffs in the wake of the Uruguay Round of global trade liberalization, the effect of those decreases has been tempered by a corresponding rise in non-tariff barriers (NTBs). In fact, the number of technical barriers to trade reported to the WTO reached a record high of 1,560 in 2012.[26] NTBs refer to measures other than tariffs which distort trade. Examples include:

quantitative restrictions; price controls; non-tariff charges; unwarranted customs procedures; discriminatory health and safety standards; currency manipulation; discriminatory application of technical standards; and localization barriers to trade (LBTs). Localization barriers to trade are a particularly pernicious and rapidly growing form of NTB that represent a wide range of policies—from local content requirements and forced offsets to mandated IP or technology transfer—which seek to explicitly pressure foreign enterprises to localize economic activity in order to compete in a country's markets.[27] Like tariffs, NTBs are designed to keep foreign products out of domestic markets, which can limit the efficient market size for industries, particularly innovation industries. As discussed above, for innovation industries, this creates harmful side-effects—primarily, it keeps unit costs for a product (or service) high, thereby reducing revenue needed to invest in the next generation of innovation and limiting their adoption.

In fact, though difficult to measure, it is likely that non-tariff barriers now have a greater detrimental impact on world trade than tariffs do.[28] Accordingly, the TPP should seek wherever possible to eliminate discriminatory standards, industry-specific market distorting subsidies, regulatory distortions, and other non-tariff barriers that prevent effective access for one country's goods and services exports to other TPP countries' markets. Among TPP parties, barriers to trade in services, barriers to digital trade, and barriers to foreign direct investment/ownership constitute three of the most significant NTBs that should be addressed as part of an innovation-maximizing TPP Agreement.

Barriers to Services Trade Among TPP Parties

Services account for an increasing share of economies' employment, GDP and economic growth. In fact, on average among APEC economies, services account for twice as large a share of GDP as manufacturing industries. Unfortunately, services sector restrictions remain with regard to several sectors in TPP countries, notably in financial services, telecommunication services, transportation services, and audiovisual services.[29]

Services are delivered in four ways: 1) across borders, including via digital networks; 2) by providing the service in the firm's home country to a service consumer who is visiting the country; 3) by providing the service within the territory of a country through the firm's subsidiary or branch; or 4) by temporarily sending an employee overseas.[30] While each method is designed to increase the market scale of a firm, it is the first method—digital networks—that is the most innovative and applies to sectors such as audiovisuals and telecommunications.

Economies that limit trade in services across borders can miss out on innovation-stimulating effects from these transactions. For example, in the audiovisual sector, an expanded market size is critical to expanding the audience. While it requires significant cost to produce and create the first copy of a film, it costs much less to show a film in different countries, especially given the advent of digital media platforms. The revenues from this can then be reinvested into the next round of audiovisual productions, leading to higher quality films, including ones with better special effects and sound editing. However, when an economy limits this process, by either setting foreign content quotas or banning digital networks, it reduces the potential revenues that audiovisual enterprises can earn and

precludes their reinvesting these profits back into innovation efforts. Thus, economies that shield their domestic services sectors from foreign competition will only experience lower rates of innovation in those sectors, and thus lower rates of productivity and economic growth across the economy as a whole.[31]

Table 3 shows TPP countries' scores on the GATS (General Agreement on Trade in Services) Commitments Restrictiveness Index, which measures the extent of GATS commitments for all 155 services sub-sectors as classified by the GATS. Economies are scored from 0 (unbound or no commitments) to 100 (completely liberalized). The United States significantly leads TPP parties in services trade liberalization, followed by Australia, New Zealand, and Canada.

An innovation-maximizing TPP Agreement needs to secure commitments from member countries to significantly liberalize trade across all services sectors, and particularly to remove barriers to trade in digital services.

TPP Party	Score
United States	65.2
Australia	59.0
New Zealand	52.2
Canada	51.1
Japan	48.8
Mexico	35.9
Vietnam	30.2
Malaysia	25.4
Peru	24.6
Singapore	22.7
Chile	9.5
Brunei	4.4
TPP Average	**35.7**

Table 3: General Agreements on Trade in Services Commitments Restrictiveness Index, 2009[32]
Note: Higher scores indicate more liberalized economies

The extensive limitations on trade in services documented here are not consonant with the spirit of trade liberalization envisioned by the Trans-Pacific Partnership and need to be significantly curtailed by partner countries. An innovation-maximizing TPP Agreement needs to secure commitments from member countries to significantly liberalize trade across all services sectors, thus enabling services to be delivered more cost effectively, efficiently, and flexibly across all markets in TPP member countries.

Specifically, the *2013 National Trade Estimate Report on Foreign Trade Barriers* (like the *2012 Trade Estimate Report* before it) notes that almost every would-be U.S. TPP partner places significant barriers on trade in services. In Japan in 2012, the Ministry of Finance (MOF) announced that it intends to begin levying a consumption (value-added) tax on music and books distributed online from overseas to consumers in Japan, in an attempt to make Japanese content cheaper than its foreign counterparts.[33] Malaysia's restrictions on foreign accounting, architectural, audiovisual and broadcasting, financial, legal, engineering, and retail trade services remain. Though a 2012 law now allows foreign law firms to practice in Malaysia through a partnership or qualified license, until it is implemented, foreign lawyers may not practice Malaysian law, nor may they affiliate with

local firms or use the name of an international firm. In addition, foreign architectural firms can only operate in Malaysia as joint venture participants.[34] In Mexico, foreign companies must form joint ventures with Mexican partners to receive authorizations (called "concessions" under Mexican law) to provide satellite-based telecommunication services—a policy that "serves as a barrier to market entry for new competitors" and that "may make many services economically infeasible."[35] New Zealand's barriers to competition in wireless communications through high mobile termination rates remain, while Peru proposed a new law in 2012 that is concerning to countries engaged in cross-border data flows.[36] Singapore continues not to permit foreign law firms to practice Singaporean law or litigate in local courts unless specifically approved to do so, and it continues to impose barriers on foreign banks' use of local ATM networks.[37] While Vietnam did change its law in 2012 to permit foreign ownership of express delivery services, it continues to restrict foreign investment in cinema construction and operation, and it subjects films to censorship before public viewing—a process it operates without transparency or the right of appeal.[38] Chile, which scores among the two lowest countries in Table 3, along with Brunei, maintains high mobile termination rates, the wholesale per-minute rate paid by an originating mobile provider to the terminating mobile provider when a call is placed from subscribers from one network to subscribers of another. These rates discriminate against smaller foreign mobile service providers compared to larger domestic ones within the Chilean market.

Barriers to Trade in ICT Products and Services among TPP Parties

Digital trade is important because ICTs are the global economy's strongest driver of productivity, innovation and growth. For example, the McKinsey Global Institute estimates that the Internet alone accounted for 21 percent of aggregate GDP growth between 2007 and 2011 across 13 of the world's largest economies, including France, Germany, Italy, Sweden, the United Kingdom, and the United States.[39] A March 2013 study by Finland's Ministry of Employment and Economy estimates that, by 2025, half of all value in the global economy will be created digitally.[40] ITIF estimates that the annual global economic benefits of the commercial Internet equal $1.5 trillion, more than the global sales of medicine, investment in renewable energy, and government investment in R&D, combined.[41]

Therefore, ensuring the uninhibited flow of information, data and ICT products and services across borders is vital to realizing a robust global economy as well as healthy individual economies within the parties to the TPP.

Localization Barriers to Digital Trade

Given the importance of international flows of data and information, the TPP should secure rights for cross-border information and data flows (while ensuring that legitimate privacy, security, and intellectual property rights are protected). Further, the TPP Agreement should allow business enterprises from TPP parties to transact business through e-commerce platforms without having to establish a commercial presence in each country. The TPP should also prohibit requirements that businesses must use local computing infrastructure, such as servers, as a condition of doing business or making an investment in a TPP country, or engaging in e-commerce or cross-border trade. This would mark the first

time that protection of cross-border data flows has been negotiated in a U.S. trade agreement.

Unfortunately, a number of would-be TPP partners, both developed and developing, have introduced localization barriers to digital trade, particularly regarding laws mandating use of local ICT infrastructure such as data centers or laws mandating local data storage. For instance, starting September 1, 2013, Vietnam's Decree 72 implements localization requirements mandating that all Internet services companies, such as Google or Facebook, must operate at least one data center in Vietnam itself.[42] Decree 72's requirement that companies providing Web search portals, cloud computing services, or digital media locate data centers in Vietnam directly violates the country's computer and related services commitments under the WTO GATS Agreement. For its part, Malaysia has passed a local data server requirements law, although it has yet to implement it.[43]

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Beyond establishing laws mandating that foreign enterprises must establish local IT infrastructure in a country in order to provide digital services, a number of countries have also enacted local data storage or local data residency laws. In fact, among would-be TPP partners, at least seven—Australia, Brunei, Canada, Malaysia, New Zealand, and Vietnam—have introduced or are actively considering introducing local data storage requirements or onerous data security and data privacy regulations that would create geographic restrictions on where ICT service providers can store and process data.

For example, Australia's government has implied that hosting data overseas, including in the United States, by definition entails greater risk and unduly exposes consumers to their data being scrutinized by foreign governments.[44] And, in July 2012, Australia's Personally Controlled Electronic Health Records Act, which prohibits the overseas storage of any Australian electronic health records, went into effect.[45]

In Canada, two provinces, British Columbia and Nova Scotia, have implemented laws mandating that personal information in the custody of a public body—such as primary and secondary schools, universities, hospitals, government-owned utilities, and public agencies—must be stored and accessed only in Canada unless one of a few limited exceptions applies.[46] These laws prevent such public bodies in those provinces from using foreign digital service providers in cases where personal information could be accessed from or stored in a foreign country. This effectively constitutes a local data storage requirement that precludes foreign Internet companies from offering cross-border digital services such as cloud computing in those Canadian markets. The Australian and Canadian rules on health records have essentially applied a blanket requirement that certain personal data be stored in-country.[47] Similarly, in 2010, New Zealand's Inland Revenue Service issued a "Revenue Alert" stating that companies were required to store business records in data centers physically located in New Zealand in order to comply with the Inland Revenue Acts.[48]

Elsewhere, Brunei and Vietnam have introduced data residency laws having the effect that companies can store the data they collect only on servers in-country.[49] And in 2012, Peru promulgated a privacy law that has caused concern among companies dependent on cross-border data flows, as it is unclear how certain provisions, particularly consent requirements, will be implemented.[50]

In many instances, these laws are motivated by, or at least justified on the basis of, privacy concerns. The belief is that, if data are required to be kept within a country, either it will be more secure or governments will be better able to prosecute those who violate privacy laws. But neither is true. Data are no more likely to be secure or insecure in Brunei, Vietnam or the United States. Data breaches can occur anywhere. And rogue employees can be anywhere. If anything, just as money is more secure in established banks, data are likely more secure in large established cloud providers that are global in scope. The second issue of jurisdiction is just as flawed. The location of servers has absolutely no effect—for good or bad—on privacy, as the local government would still have legal jurisdiction over companies who own the data, regardless of where their data are actually stored. For example, if a hospital in British Columbia stores its data in Australia and there is a breach due to poor security practices there, the British Columbia government would still have legal authority over the British Columbia hospital. Mandating that data be stored locally has no positive effect on privacy or security.

ICT Products with Encryption Technology

Some governments have recently relied on overbroad or unfounded security concerns to justify regulation that can discriminate against foreign ICT products and create significant trade barriers. This trend has increasingly applied to the encryption capabilities of ICT products, as nearly all ICT products contain cryptographic capabilities. Yet the vast majority of businesses use encryption for email and database security, data transfer, and online payments. Consumers use it to protect and secure their personal information held in smart phones, computing tablets, or on the Internet. Governments use it to provide secure online services. Encryption has become the foundation of Internet and e-commerce development, and thus a key driver of economic growth.

Therefore, the TPP Agreement should address the issue of data encryption. Because burdensome or discriminatory regulation of encryption can impair consumer access to the most secure products, TPP parties should commit to the unrestricted import, use, and sale of products with cryptographic capabilities in the commercial market.[51] Such a commitment would ensure that consumers and businesses operating in TPP countries can purchase the best ICT products, technologies, and systems available in the global marketplace for security and privacy. This is important because access to leading-edge technologies is ultimately the best defense against online crime, fraud, and theft.

If and where regulation is necessary, a global, cooperative approach to encryption should be sought, to avoid disrupting the global digital infrastructure, and to create an environment in which consumers and businesses have trust in online commerce. Such regulation should neither include requirements to transfer or provide access to a particular technology, production process, or other proprietary knowledge, nor mandate a particular technology or standard that is not based on a relevant international standard.

Local Content Requirements

Local content requirements mandate that a certain percentage of goods or services sold in a country must be produced with local content.[52] Countries define "local content" in a variety of ways, such as the percentage of local components used in the assembly of a final product; the share of locally developed intellectual property embodied in the development

of a product or service; or even the share of locally produced or local content in the broadcasting and audiovisual sectors. Countries use local content requirements (LCRs) more than any other type of LBT. In fact, analysts from the Peterson Institute for International Economics estimate that local content requirements affected almost $928 billion of total global trade in goods and services in 2010, or about 5 percent of the $18.5 trillion of total global trade.[53] They estimate that the actual reduction of world trade on account of new LCRs amounts to $93 billion annually and that almost 3.8 million jobs are affected by LCRs.[54] Unfortunately, several would-be TPP countries have introduced local content requirements, particularly in the energy and audio-visual sectors.

For example, in August 2013, Mexican President Peña Nieto introduced an energy reform package that includes proposed local content rules in procurement and infrastructure projects in the oil and gas sector, with the understanding that Pemex, Mexico's largest oil producer, "will finally be compelled to enforce" them.[55] Several TPP parties impose domestic content requirements as a condition of renewable energy providers being eligible to receive subsidies and feed-in tariff (FIT) incentives.[56] For instance, Canadian provinces Ontario and Quebec have required that up to 50 percent and 60 percent, respectively, of renewable energy equipment be locally sourced in order for the renewable energy provider to be eligible for subsidies and feed-in tariff incentives.[57] In December 2012, WTO judges agreed with complainants European Union and Japan that provisions of these Canadian programs discriminated against foreign suppliers of equipment and components for renewable-energy generation facilities by affording less-favorable treatment to imported equipment and components than given to like-products originating in Ontario. Yet Canada is not alone among would-be TPP partners in introducing local content requirements in clean energy. The Malaysian Renewable Energy Bill of 2010 foresees a variable FIT linked to local content requirements. In addition, biogas, biomass, and solar photovoltic producers receive a bonus FIT payment when locally manufactured or assembled components are used.[58]

Several TPP parties impose local content requirements in the audiovisual services sector. Australia's Broadcasting Services Amendment Act requires subscription television channels with significant drama programming to spend 10 percent of programming budgets on new Australian drama programs.[59] And 55 percent of air time on free television channels between 6am and midnight must be Australian-made.[60] Malaysia maintains a plethora of LBTs in the audiovisual services sector—80 percent of broadcast television programming must originate from local production companies owned by ethnic Malays, and 60 percent of radio programming must be of local origin.[61] Moreover, Malaysia imposes a "Made in Malaysia" requirement on advertisements aired on free and pay television, requiring that they be produced in Malaysia, using Malaysian citizens, with no more than 20 percent footage or productions costs from outside Malaysia; the government may provide exemptions covering no more than 30 percent of total advertising on a channel.[62] Also, as a condition for obtaining a license to operate in Malaysia, video rental establishments are required to have 30 percent local content in their inventories.[63] For its part, in 2011, Vietnam passed a law requiring that all advertising shown on pay TV in Vietnam be produced in Vietnam.[64]

The TPP should include full prohibition against member countries' use of all localization barriers to trade, including local content requirements.

Restrictions on Foreign Direct Investment among TPP Parties

A vital component of expanded market access for innovation industries is the ability to engage in foreign direct investment (FDI). In fact, global commerce is increasingly driven by FDI, rather than just trade alone. In the transpacific market, cross-border investments are essential to growth and prosperity. FDI can contribute significantly to regional innovation capacity and economic growth, in part through the transfer of technology and managerial know-how. But restrictions on FDI reduce this capacity, primarily by restricting the market size for innovative foreign enterprises that wish to invest in FDI, ultimately raising production costs for the innovative domestic enterprises that lose out on the improved technology and knowledge from abroad.

The TPP should include full prohibition against member countries' use of all localization barriers to trade, including local content requirements.

Unfortunately, several TPP parties continue to impose substantial restrictions on foreign direct investment and ownership. Table 4 ranks TPP parties regarding their broader, economy-wide openness to both inward and outward FDI. Countries' FDI regimes are evaluated across three categories according to the methodology of the global *Investing Across Borders* project of the World Bank Group. The first category corresponds to FDI equity restrictions. The second category corresponds to the ease with which foreign nationals can establish and operate businesses, while the third category examines the laws and regulations that an economy relies on to regulate its domestic and international arbitrations.

TPP Party	Investing Across Sectors	Starting a Foreign Business	Strength of Laws for Domestic and International Arbitration
Chile	100	63.2	94.9
New Zealand	100	84.2	97.4
Peru	99.1	72.5	97.4
Australia	96.2	84.2	81.7
United States	95.2	80.0	85.0
Singapore	88.6	78.9	94.9
Brunei	86.7	76.3	89.4
Japan	84.8	81.6	95.4
Canada	81.4	81.6	89.9
Vietnam	68.8	57.9	84.9
Malaysia	67.5	60.5	94.9
Mexico	63.8	65.8	79.1
TPP Average	**86.0**	**73.9**	**90.4**

Table 4: Openness to Inward and Outward Foreign Direct Investment[65]
Note: 100 = Best; 0 = Worst

Australia, Canada, Japan, New Zealand, Singapore, and the United States generally score highly across the board. Chile and Peru score highly in foreign equity ownership, yet perform less well when it comes to their business environments. Economies that restrict foreign ownership and provide a poor regulatory environment for foreign enterprises

include Malaysia, Mexico, and Vietnam. The TPP Agreement should assiduously seek to remove barriers to inward and outward foreign direct investment among member countries.

In addition, some of the most significant barriers to FDI remain in the telecommunications sector. APEC's May 2011 *Investing Across Borders* report addresses market accessibility in the telecom sector, which can be measured by examining the maximum foreign participation or ownership allowed in a country's telecom sector, as Table 5 shows.[66]

TPP Party	Foreign Equity Ownership Index, Telecommunications
Chile	100
New Zealand	100
Peru	100
Singapore	100
United States	100
Japan	83.3
Mexico	74.5
Australia	63.2
Vietnam	50.0
Brunei	49.0
Canada	46.7
Malaysia	39.5
TPP Average	**74.8**

Table 5: Foreign Equity Ownership Index, Telecommunications[67]
Note: High Score Represents Maximum Foreign Ownership Allowed in Telecom Sector

While five of the 12 TPP parties have fully liberalized their telecommunications markets, substantial barriers to foreign equity ownership remain in the other seven countries. For instance, Canada maintains a 46.7 percent limit on foreign ownership of suppliers of facilities-based telecommunications services, except for submarine cable operations.[68] In fact, of all *OECD* countries, Canada ranks last in its level of telecommunications market liberalization. Elsewhere in the TPP, Australia caps foreign equity interest in Telestra, its largest telecom, at 35 percent, with individual investors only allowed to own up to 5 percent of the company; Malaysia entitles foreign companies to acquire only up to a 30 percent equity stake in facilities-based telecommunications operators; Mexico's Foreign Investment Law limits foreign ownership in the wireline segment to 49 percent; and Vietnam caps foreign ownership of private networks at 70 percent.[69]

In contrast, in the United States, Section 310(b)(4) of the *Communications Act* governs the situations of foreign ownership interest in a U.S.-organized company (a Parent) that controls another U.S.-organized company that holds Federal Communications Commission (FCC) common carrier or aeronautical licenses. Section 310(b)(4) establishes a 25 percent benchmark for foreign ownership in U.S.-organized Parents. However, direct or indirect foreign ownership in a Parent *may exceed 25 percent* (and frequently does, even

up to 100 percent), unless the FCC determines that such ownership would not be in the public interest. Typically, licensees wishing to secure FCC approval of foreign ownership of a Parent exceeding 25 percent must file a petition. The FCC, and certain Executive Branch agencies—such as the Department of Justice and Homeland Security— must approve the petition to ensure that it is consistent with national security, law enforcement, foreign policy, and trade policy concerns before direct or indirect foreign ownership of the U.S. Parent can exceed 25 percent.

PROVISIONS TO LIMIT NON-MARKET 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" relation, with both too much and too little competition producing less innovation. One study of UK manufacturing firms found this relationship. Others, including Scherer and Mukoyoma, have found similar patterns.[70] In a study of U.S. manufacturing firms, Hashmi found that too much competition led to reduced innovation in a slightly negative relationship.[71] In other words, firms need to be able to obtain "Schumpeterian" profits to reinvest in innovation that is both expensive and uncertain. As Carl Shapiro notes, "innovation incentives are low if ex-post competition is so intense that even successful innovators cannot earn profits sufficient to allow a reasonable risk-adjusted rate of return on their R&D cost."[72]

This does not mean that market-generated competition is detrimental. Normally, markets will not produce an excess number of competitors. But governments often do, through financial bail-outs, discriminatory government procurement, or other policies favoring weaker domestic innovation firms. For example, France's ill-fated gambit in 2008 to introduce the French-backed search engine Quaero "as the next Google-killer" was a clear manifestation of favoring a weak domestic firm.[73] So was the French government's April 2012 announcement that it will fund one-third of a €225 million joint venture with two French telecom and technology companies, Orange Telecom and Thales, to create a new cloud computing company that will provide processing, storage, and bandwidth cloud computing services to French and European companies.[74]

In addition, firms themselves also sometimes produce an excess number of competitors. The decision by five companies—Hynix, Infineon, Micron Technology, Samsung, and Elpida—to collude on prices for dynamic random access memory (DRAM) chips is one example of this. DRAM is the most commonly used semiconductor memory product, providing high-speed storage and retrieval of electronic information for a wide variety of computer, telecommunications, and consumer electronic products. DRAM is used in personal computers, laptops, workstations, servers, printers, hard disk drives, personal digital assistants, modems, mobile phones, telecommunication hubs and routers, digital cameras, video recorders and televisions, digital set-top boxes, game consoles, and MP3 digital music players. In 2002, the U.S. Department of Justice charged these companies with price-fixing under the *Sherman Antitrust Act*, stating that their policies imperiled free markets, impaired innovation and harmed U.S. consumers.[75]

These policies enable weak firms to enter into or remain in a market, drawing off sales from stronger firms and reducing their ability to reinvest in innovation. To be clear, some government innovation policies can be pro-innovation if they help innovative firms overcome particular challenges. Public-private research partnerships, such as Japan's Kohsetsushi Centers, are a case in point.[76] But these partnerships, designed to help firms in an industry solve complex technical challenges, are different from mercantilist policies subsidizing or protecting particular firms which otherwise would exit the market.

Thus, the TPP needs to be a trade agreement dedicated to eliminating excess competition stemming from discriminatory government procurement, protected SOEs and government bailouts.

Open and Non-discriminatory Government Procurement

A key TPP goal should be to enhance business opportunities through substantially improved access to government procurement opportunities at all levels of government on the basis of fair national treatment, regardless of firm ownership status. In essence, this means that governments should not discriminate against foreign firms in their procurement practices.

Governments often produce an excess number of competitors, through financial bail-outs, discriminatory government procurement, or other policies favoring weaker domestic innovation firms.

It is important to note that there are two ways to consider discriminatory government procurement practices; the first, involving localization barriers to trade, relies on market balkanization through hindering the expansion prospects of foreign firms into new regions. This can include forcing local production or local infrastructure in order to be eligible for government contracts. The second—which includes many of the practices the TPP parties engage in—relies on creating excess, potentially inefficient competition, by propping up high-cost domestic enterprises at the expense of lower-cost foreign ones. This can include setting price preferences for domestically owned enterprises, or erecting onerous contract and certification regulations for foreign firms.

The WTO's Government Procurement Agreement prohibits restrictions on government purchases between member countries, stating that companies in other signatory countries will be treated no less favorably than domestic companies in accordance with the principles of national treatment and non-discrimination. This applies at both the central and sub-central levels of government.

It is therefore a concern that only three of the eleven other TPP parties, Japan, Singapore and Canada, are signatories to the GPA, as Table 6 shows. Australia, Chile, Malaysia, and New Zealand are observers of the GPA, meaning that they participate in the discussions at the meetings and follow the proceedings of the WTO Committee on Government Procurement, but are not obliged to fulfill commitments related to the Agreement. Australia is the only major industrialized country that is not a GPA signatory.[77] To its credit, Malaysia became a GPA observer on July 18, 2012. Brunei, Mexico, Peru, and Vietnam are neither signatories to nor observers of the GPA. A country's membership in the TPP should be contingent on its being a full-fledged signatory to the WTO's Government Procurement Agreement.

Signatories	Observers	Non-Signatories
Canada	Australia	Brunei
Singapore	Chile	Mexico
United States	Malaysia	Peru
Japan	New Zealand	
	Vietnam	

Table 6: TPP Members' Participation in WTO's Government Procurement Agreement[78]

One reason for this is that high rates of preferential treatment in government procurement continue to exist among TPP parties. For example, in Brunei, "the [government procurement] award process often lacks transparency, with tenders sometimes being not awarded or re-tendered for reasons not made public."[79] Malaysia's official policy still allows government procurement to support blatantly mercantilist national public policy objectives, such as forcing the transfer of technology from foreign to domestic industries, reducing the outflow of foreign exchange, providing advantages to local companies in the service sector, or boosting Malaysia's export capabilities.[80] Malaysia's lack of transparency in government decision-making and procedures has impeded U.S. firms' access to the Malaysian market. Vietnam's continued "lack of transparency, accountability, and media freedom, along with widespread official corruption and inefficient bureaucracy," remains a serious obstacle to foreign business activities, including the ability to compete for government procurement contracts.[81] Elsewhere, discriminatory practices also remain evident with regard to procurement of foreign pharmaceuticals by the national health systems of several TPP parties, including Australia and New Zealand.[82] For example, foreign stakeholders continue "to express strong concerns about New Zealand's Pharmaceutical Management Agency's (PHARMAC's), regulatory process, including the lack of transparency, timeliness, and predictability in the funding process and for unreasonable delays in reimbursing new products."[83]

The TPP represents an important opportunity to develop more adequate and effective rules governing the operation of SOEs and SSEs so that companies from all countries can compete on equal footing under terms of "competitive neutrality."

Non-preferential Treatment of State-Owned Enterprises

The TPP represents an important opportunity to develop more effective rules governing the operation of state-owned enterprises (SOEs) and state-supported enterprises (SSEs) so that companies from all countries can compete on equal footing under terms of "competitive neutrality."[84] Competitive neutrality—a key principle advocated in the OECD's work on SOEs and corporate governance—holds that government-supported business activities should not enjoy net competitive advantage over their private sector competitors.[85] This is because when SOEs do have net competitive advantages over their private sector counterparts, it creates unfair and excess competition in the market—in other words, it favors these enterprises at the expense of private sector ones.

Thus, writing the TPP agreement so that it precludes preferential treatment of state-owned enterprises remains extremely important, in part because several current TPP parties exhibit extensive SOE or SSE activity. As one attempt to measure this, *The Economic Freedom of the World* report uses an index of government enterprise and investment based on the number, composition, and share of output supplied by state-operated enterprises and government investment as a share of total investment. Economies are ranked from 10 to 0. Countries with few SOEs and where government investment is generally less than 15

percent of total investment receive a 10, and countries where the economy is dominated by SOEs and government investment exceeds 50 percent of total investment receive a 0.[86]

TPP Member Country	Government Enterprise & Investment Rating	Government Investment as a Share of Total Investment in Economy (%)
Chile	10	10.6
Australia	8	15.6
Canada	8	18.8
Japan	8	16.4
United States	8	18.3
Peru	8	18.7
New Zealand	8	19.4
Singapore	7	N/A
Mexico	6	29.3
Malaysia	2	42.7
Vietnam	N/A	N/A
Brunei	N/A	N/A
TPP Average	**8**	**23.6**

Table 7: Government Investment as a Share of Total Investment in Economy, 2013[87]
Note: In column 2, high score indicates a better performing economy. In column 3, low score indicates a better performing economy.

On this measure, one TPP party—Chile—scores a 10, while another six score an 8—Australia, Canada, Japan, Peru, New Zealand and the United States. Singapore scores a 7 and Mexico a 6. But Malaysia's score of 2 reflects a substantial number of state-owned enterprises operating in many sectors, including manufacturing, with government investment accounting for over 40 percent of total investment in the economy.[88]

Thus, it is important that the TPP ensure non-preferential treatment of state-owned enterprises among member nations. Specifically, the TPP should clarify the scope and coverage of national treatment, explicitly subjecting state-influenced entities to a robust national treatment obligation. The goal is to preclude policies and practices, like government bailouts, that benefit state-supported firms and entities and give them unfair advantage over private firms in competing for market access in their home markets, in cross-border transactions, and in third markets.[89] In addition, the existing procurement exemption of the national treatment obligation should be modified to prevent misuse of the provision that could allow wide swaths of state behavior to escape the basic non-discrimination obligation. Specifically, the procurement exemption should be replaced with a more limited exception to national treatment for purchases by and for the use of identified government agencies and covered entities.[90]

PROVISIONS TO PROTECT THE BASE OF INTELLECTUAL PROPERTY

Firms in innovation-based industries depend on intangible capital, much of it intellectual property. Strong intellectual property rights spur innovative activity by increasing an innovator's ability to appropriate the returns to innovation, enabling them to capture more of the benefits of their own innovative activity. By raising the private rate of return closer

to the social rate of return, intellectual property addresses the knowledge-asset incentive problem, allowing inventors to realize economic gain from their inventions, thereby catalyzing economic growth. In addition, as they capture a larger portion of the benefits of their innovative activity, innovators obtain the resources to pursue the next generation of innovative activities. However, if competitors are able to enter and/or remain in the market because they obtain an innovator's IP 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 a result, the protection of intellectual property is important for three reasons. First, it strengthens overall global innovation. Academic evidence supports the theory that IP policy significantly influences direct investment in new technology areas such as biotechnology, semiconductors, and computer software.[91] For example, the United Nations Commission on Transnational Corporations (UNCTC) has found that weak IP rights reduce pharmaceutical and software investment.[92] Weak IP rights reduce flows of all types of commercial activities—trade, FDI, and technology transfer—regardless of an economy's level of economic development.[93] By contrast, strengthening of intellectual property rights has been connected to increased inflows of both FDI and trade in high technology products.[94]

Robust IP protection also leads to increased levels of R&D and innovation in both developing and developed economies. A number of studies have found that R&D/GDP ratios are positively related to the strength of patent rights.[95] Cavazos Cepeda et al. find that for every 1 percent increase in the level of protection of IP rights in an economy—measured by improvements to an economy's score in the Patent Rights Index—there was, on average, a 0.7 percent increase in the domestic level of R&D. Likewise, a 1 percent increase in copyright protection is associated with a 3.3 percent increase in domestic R&D, while a 1 percent increase in trademark protection is associated with a 1.4 percent increase in domestic R&D.[96] Ultimately, as a definitive OECD review of the effects of IP rights protections on developing economies found, "the results point to a tendency for IPR reform to deliver positive economic results."[97] Thus, given the importance of IP to global innovation, it is important the TPP enshrine strong protection.

Second, maintaining strong IPR protections is particularly important in knowledge-based economies such as the United States. Because the United States is more IP-based than most other economies around the world, it does not specialize in low-cost commodity production, where IP is a less important factor. Moreover, as one of the few nations whose economy is at the production possibility frontier, innovation is the principal way for the U.S. economy to progress.

Indeed, IP-intensive industries are a key source of high-paying U.S. jobs, exports, and overall economic growth. IP-intensive industries directly support 27.1 million U.S. jobs, and indirectly support an additional 12.9 million jobs, meaning that IP-intensive companies support at least 40 million jobs, or 20 percent of all U.S. private sector employment.[98] Moreover, jobs in IP-intensive industries pay 42 percent more than the average U.S. wage.[99] IP-intensive industries exported more than $1 trillion worth of goods and services in 2011, accounting for approximately 74 percent of total U.S. exports that

year.[100] In total, IP-intensive industries contribute over $5.1 trillion in economic output, accounting for nearly 35 percent of U.S. GDP in 2010.[101] Sixty-one percent of U.S. merchandise exports, totaling $775 billion, depend on IP. Consequently, IP theft is extremely damaging to U.S. companies and to the overall U.S. economy. The Department of Commerce finds that theft of U.S. intellectual property tops $250 billion annually.[102] In fact, the U.S. International Trade Commission estimates that, in 2009 alone, Chinese theft of U.S. intellectual property cost almost one million U.S. jobs and caused $48 billion in U.S. economic losses.[103] Given the importance of IP-intensive industries to the U.S. economy, it is vitally important that the TPP include robust IPR protections.

Finally, the protection of IP in developing economies is an important step toward the creation of their own robust technology and pharmaceutical sectors. For example, Ryan, in a study of biomedical innovations and patent reform in Brazil, finds that patents provided incentives for biomedical technology entrepreneurs to make risky investments into innovation and facilitated technology markets among public-private technology innovation networks.[104] And a new OECD working paper, *Trade & Innovation: Pharmaceuticals*, attributes part of the success of the pharmaceutical sectors of Brazil, China, and India to the introduction of patent protection.[105] It shows emerging economies are increasingly important markets for pharmaceutical companies and more active participants in the R&D process. In addition, it demonstrates that stronger patent protection, alongside less stringent price control, tends to encourage more or faster launches of drugs, while IPRs lead to much greater introduction of foreign pharmaceutical products into developing markets and help contribute to the globalization of clinical trials.

In summary, securing strong intellectual property protection is in the interest of the United States, of the partner TPP member countries, and the broader world economy.

Moreover, a study by Charles River Associates, *Policies that Encourage Innovation in Middle-Income Countries,* finds that for countries whose "objective is to develop an innovative biopharmaceutical industry (either by domestic companies or investment by international companies), intellectual property is a necessary building block."[106] It further finds that middle-income countries such as Colombia and Malaysia that perform relative to peers in innovation indicators, such as biopharmaceutical R&D spending, number of biopharmaceutical patents filed, journal articles published, and clinical trials carried out, have fallen behind because they "lack a consistent system for securing intellectual property rights."[107]

In summary, securing strong intellectual property protection is in the interest of the United States, of the partner TPP member countries, and the broader world economy. TPP negotiators have made considerable progress over the prior 19 negotiating rounds in shaping the agreement, yet a number of complex issues remain, particularly those relating to the IPR provisions of the agreement. The outstanding IPR challenges include a range of important issues from protections for patents and trade secrets to protections for biopharmaceutical products.[108] As the United States' negotiators move closer to finalizing the TPP, it is imperative that they seek to secure the highest standards of intellectual property rights protection, including on issues such as protecting trade secrets and providing 12 years of data exclusivity protection for novel biologic medicines.

State of IPR Protection among TPP Parties

Unfortunately, several of the current and candidate TPP signatories have weak IP protection records. The United States Trade Representative Office's *Special 301 Report* places countries that do not provide "adequate and effective" protection for U.S. intellectual property rights holders on either a Watch List or Priority Watch List. (Countries placed on the Priority Watch List are the focus of increased bilateral attention concerning the problem areas.) USTR's 2013 *Special 301 Report* places four TPP countries— Canada, Mexico, Peru, and Vietnam—on the Special 301 Watch List, and one more—Chile—on the Priority Watch List, as Table 1 shows.[109] There were two changes from the 2012 *Special 301 Report*: the removal of Brunei from the Watch List and the downgrading of Canada from the Priority Watch List. The four other TPP parties on the 2012 report remained on the 2013 report. If the TPP is to truly be a twenty-first century trade agreement, it cannot include countries, or at least cannot permit the practices of countries, consistently finding themselves on the United States' Special 301 Watch List for failure to adequately enforce intellectual property rights. If these countries wish to join the TPP, they need to get off the Watch List and stay off.

If the TPP is to truly be a twenty-first century trade agreement, it cannot include countries, or at least cannot permit the practices of countries consistently finding themselves on the United States' Special 301 Watch List for failure to adequately enforce intellectual property rights.

Watch List	Priority Watch List
Canada	Chile
Mexico	
Peru	
Vietnam	

Table 8: TPP Parties' Statuses on USTR's Special 301 Watch or Priority Watch List[110]

For its part, Chile remains on the 2013 Priority Watch List because it has yet to adequately implement "an effective system to address patent issues expeditiously in connection with applications to market pharmaceutical products."[111] Canada was moved to the Watch List because of the "passage of the Copyright Modernization Act, which, among other things, is designed to implement Canada's obligations under the World Intellectual Property Organization (WIPO) Internet Treaties and to address the challenges of copyright piracy in the digital age."[112] However, the United States "continues to have serious concerns about the availability of rights of appeal in Canada's administrative process for reviewing regulatory approval of pharmaceutical products and also has serious concerns about the impact of the heightened utility requirements for patents that Canadian courts have been adopting recently."[113]

Mexico is on USTR's Watch List because "serious concerns remain, including with respect to the widespread availability of pirated and counterfeit goods in Mexico."[114] While Peru has enacted laws to criminalize the sale of counterfeit medicines, "the United States remains concerned about the widespread availability of counterfeit and pirated products in Peru in general, and notes that Peru needs to devote additional resources for IPR enforcement."[115] Vietnam did take steps in 2011 to improve its IP regulatory framework by passing decrees to strengthen copyright protection and border enforcement; however, as USTR notes, "piracy and sales of counterfeit goods over the Internet is a growing concern, and counterfeit goods remain widely available in physical markets as well."[116] USTR's

concerns over piracy in Vietnam are warranted because software piracy rates among several TPP parties remain exceptionally high, particularly in Malaysia, Mexico, Chile, Brunei, and Peru, in addition to Vietnam, as Table 9 illustrates. Members of an innovation-maximizing TPP Agreement must bring down these software piracy rates significantly.

TPP Party	Unlicensed Software Units as Percentage of Total Software Units
United States	19
Japan	21
New Zealand	22
Australia	23
Canada	27
Singapore	33
Malaysia	55
Mexico	57
Chile	61
Brunei	67
Peru	67
Vietnam	81
TPP Average	**44.4**

Table 9: Software Piracy Rates among TPP Parties[117]

Another way to view the strength of countries' intellectual property protection systems is through the Park Index. While "consistent and comparable characterization of differences in IPRs across countries and over time is formidably difficult," as Iain Cockburn notes, the Park Index is a "pioneering study" that constructed a summary index of national IPRs for 110 countries from 1960 to 2005.[118] The Park Index presents the sum of five separate scores for: coverage (inventions that are patentable); membership in international treaties; duration of protection; enforcement mechanisms; and restrictions (for example, compulsory licensing in the event that a patented invention is not sufficiently exploited).[119] The Park Index was designed to provide an indicator of the strength of patent protection in countries (though not the overall quality of countries' patent systems).[120] It provides a useful tool for measuring countries' progress at strengthening their IPR systems. The Park Index shows that the United States offers the strongest IPR protections among TPP parties, followed by Canada and Japan, while other TPP parties have significant opportunity to strengthen their IPR regimes. However, it does point to positive movement over the past decade in the strength of IPR regimes in Malaysia, Mexico, Singapore, and Vietnam, although certainly more room for improvement remains.

TPP Party	Park Index (2000)	Park Index(2005)	% Change (2000-2005)
United States	4.88	4.88	-
Canada	4.67	4.67	-
Japan	4.67	4.67	-
Chile	4.28	4.28	-

Australia	4.17	4.17	-
Singapore	4.01	4.21	5.0
New Zealand	4.01	4.01	-
Mexico	3.68	3.88	5.4
Peru	3.32	3.32	-
Malaysia	3.03	3.48	14.9
Vietnam	2.90	3.03	4.5
Brunei	N/A	N/A	N/A
TPP Average	**3.63**	**3.72**	**2.48**

Table 10: Park Index Rating of Intellectual Property Protections[121]

The Property Rights Alliance's *2013 International Property Rights Index* (IPRI) measures the intellectual and physical property rights of 131 nations around the world. The IPRI is the first international study measuring the importance of property rights, both physical and intellectual, as well as how property rights protect economic welfare. It is comprised of 10 variables, focusing on three areas: Legal and Political Environment (judicial independence, confidence in the courts, political stability, and corruption); Physical Property Rights (protection of property rights, property records, and access to credit); and Intellectual Property Rights (protection of IP, strength of patents, and copyright piracy). Countries are scored from 0 to 10, where 10 represents the strongest level of protection of property rights and 0 represents a lack of security regarding a country's property rights.

TPP Party	IPRI Overall Rank	IPRI Score
New Zealand	2	8.4
Singapore	7	8.1
Canada	9	8.0
Australia	11	7.9
Japan	14	7.7
United States	17	7.6
Chile	26	6.8
Malaysia	33	6.5
Brunei	53	5.7
Mexico	68	5.2
Peru	77	5.0
Vietnam	91	4.7
TPP Average	**34**	**6.8**

Table 11: TPP Party Scores on *2013 International Property Rights Index*[122]

The study points to the great variability in intellectual property rights protection levels among would-be TPP partners, and shows that significant strengthening of the intellectual property rights regime is needed in countries such as Vietnam, Peru, and Mexico.

Strengthening IP Protection in the TPP

In addition to overall strengthening of IP, data exclusivity and trade secret protection are two pressing IP issues that need to be addressed as part of the TPP.

Data Exclusivity

The innovative biopharmaceutical sector provides an illustrative example of the importance of IP-intensive industries to the U.S. economy. The sector supports more than 7.4 million jobs and contributes $426 billion annually to U.S. GDP.[123] Exports from the U.S. biopharmaceutical industry exceeded $50 billion in 2012, making it the fourth-largest exporter among IP-intensive industries.[124] The biopharmaceutical industry is one of the most R&D intense in the United States. In 2010, U.S. biopharmaceutical firms' R&D investments totaled $67.4 billion.[125] Measured by R&D expenditures per employee, the U.S. biopharmaceutical sector leads all other U.S. manufacturing industries, investing more than 10 times the amount of R&D per employee than the average U.S. manufacturing industry.[126] When R&D is measured as a percentage of sales, the life sciences sector has a higher rate of R&D intensity, at 12.2 percent, than any other American industry except semiconductors.[127] In total, biopharmaceutical firms' investments in the discovery of new medicines account for nearly 20 percent of all domestic R&D funded by U.S. businesses, according to the National Science Foundation.[128] This extremely high R&D intensity explains why the biopharmaceutical sector alone accounted for 5 percent of all U.S. patent applications granted in 2009—a rate seven times greater than the sector's contribution to U.S. GDP.[129] Finally, biopharmaceutical (and broader medical) innovation has contributed profoundly to improvements in global human health, benefitting both the developed and developing world. In fact, recent studies have attributed up to half of all welfare gains worldwide during the twentieth century to the introductions of new medical knowledge and technologies, including drugs.[130]

Studies find that the break-even time for biologics manufacturers to recover the average cost of development, manufacturing, promotion, and the cost of capital for a representative portfolio of biologics ranges from 12.9 to 16.2 years and averages 14.6 years.

Biotechnology represents the future of medicine, with science just beginning to harness the power of biology and new tools such as genome sequencing, proteomics, and recombinant DNA techniques to create breakthrough medical discoveries and therapeutic treatments.[131] One of the most promising frontiers is biologics. Biologics—such as the medicines Avastin, Herceptin, and Rituxan to treat cancers—are large, complex molecules made from human or animal proteins which are grown in living systems, such as microorganism, plant, or animal cells. Unlike traditional pharmaceutical drugs, which involve smaller molecules that operate largely on the basis of chemical reactions and that work by treating the consequences of a disease, biologics work by blocking diseases earlier in their development, in the immune system. And since they can be tailored to individuals taking the medicine, biologics constitute an important step toward realizing the vision of personalized medicine.[132] But as biologics are large, complex molecules that must be manufactured within living tissues, the resulting protein is unique to the cell lines and the specific process used to produce it, and even slight differences in the manufacturing of a biologic can alter its nature.[133] Therefore, the intellectual property components of a biologic include both the structure of the molecule itself and the process for how to reliably, safely, and consistently manufacture the molecule at scale in living tissues.

The difficulty of developing and manufacturing a biologic is unparalleled in the field of medicine and pharmacology. Developing an innovative biologic therapy is an arduous, risky, and expensive process. For instance, 15 years elapsed between the scientific discovery of the angiogenic growth factor VEGF and Avastin's approval as the first angiogenesis treatment for cancer.[134] For biologics that do complete the approval process, the cost to build specialized manufacturing facilities represents an additional cost beyond R&D costs that can range from $90 million to $450 million or more.[135] Yet the vast majority of biologic medicines never make it to the approval stage. Less than 15 percent of biologics move from initial pre-clinical studies to clinical trials, and the probability of success for those drugs that do reach clinical development is just 30 percent.[136] Given the time, risk, and expense involved in developing biologics, studies find that the break-even time for biologics manufacturers to recover the average cost of development, manufacturing, promotion, and the cost of capital for a representative portfolio of biologics ranges from 12.9 to 16.2 years and averages 14.6 years.[137] However, this long break-even timeframe means that biologics makers have a limited amount of time in which to recoup their investment before their intellectual property rights expire.

The United States' TPP negotiators should ensure that the TPP includes data protection provisions reflecting those embodied in U.S. laws and standards.

And while patents constitute an important form of intellectual property protection for biologics, they alone are not sufficient to create the environment needed to support large-scale investment in biologic R&D. First, because biologics are structurally complex molecules which are closely tied to a specific manufacturing process, many biologic patents are process patents or relatively narrowly constructed product patents. This means that biologics patents are susceptible to being circumvented by small changes to the molecule or to the process of making it. As Kathleen Kelleher notes, "The complexity of most biologics may allow a biogeneric manufacturer to design around an innovator's patents, but still secure regulatory approval through its "biosimilarity" to the pioneer (original) biologic."[138] Because patents fail to provide the same certainty for biologics as they do for traditional pharmaceutical drugs, they do not necessarily assure that biologics will enjoy the same length of time on the market before facing competition from generics.[139] Second, patents do not safeguard the intellectual property involved in developing the extensive clinical trial data and results required to prove the safety and efficacy of a biopharmaceutical product. For instance, the safety and efficacy data that must be provided by innovator companies to gain the U.S. Food and Drug Administration's approval of a biologic can take more than a decade to compile and requires an average of more than $1.2 billion in pre-approval R&D.

For these reasons, biologics constitute unique products that merit high levels of intellectual property protection. This has been recognized in U.S. law through the bipartisan Biologics Price Competition and Innovation Act (BPCIA), which became law as part of the Patient Protection and Affordable Care Act, and which affords 12 years of data exclusivity on novel biologic medicines. Data exclusivity protects the actual investment needed to prove the safety and efficacy of a biopharmaceutical product, ensuring that the costly clinical trial results and data developed by the biologics' innovator during the drug approval process cannot be used (during the 12-year period ensuing drug approval) by competitors seeking to secure approval for a third-party product.[140]

U.S. policymakers enshrined 12 years of data exclusivity for biologics in recognition of the need to maintain adequate incentives for biologics makers to invest in uncertain R&D activities. At the same time, this policy makes room for competition by creating a path for biosimilar manufacturers to bring biosimilars to market. As the National Academies of Science and Engineering wrote in its *Rising Above the Gathering Storm* report, "It is critical that a balance be struck in finding an appropriate period of exclusivity such that innovation is stimulated and sustained but patients have access to generic-drug-pricing structures."[141] The National Academies report recommended this data exclusivity period be at least 10 to 11 years and further suggested that "research should be taken to determine whether this period is adequate, given the complexity and length of drug development today."[142] Subsequent research, such as that performed by Duke University economist Henry Grabowski, has found that a representative biologic would not recoup its R&D costs with a data exclusivity period of less than 12 to 14 years.[143]

As a result, the United States' TPP negotiators should ensure that the TPP includes data protection provisions reflecting those embodied in U.S. laws and standards—not only because it is U.S. law, but because it represents an innovation-maximizing standard established after extensive deliberation as a fair balance between the desire to promote access to medicine and the need of biopharmaceutical firms to recoup their expensive and risky investments in R&D at a sufficient level to finance the next-generation of innovative biologics. However, during the August 2013 round of negotiations in Brunei, TPP negotiators began to discuss a new proposal regarding IP protection for pharmaceutical products. Specifically, the United States is considering a two-tier system that would apply stronger pharmaceutical IP protections to most TPP countries, but provide more flexible standards on a temporary or permanent basis to the least-developed TPP countries such as Peru, Malaysia, and Vietnam. Because the IP chapter remains one of the most significant hurdles to concluding the TPP negotiations, if these compromises must be made, it should be on a *very short, interim basis* for the fewest nations. Thus, should U.S. negotiators adopt a two-tier system, then they must insist that the developing countries adjust to meet the 12-year standard within five years of ratification of the agreement.

If the TPP Agreement fails to include 12 years of data exclusivity for biologics, on either an immediate or upcoming basis, then U.S. biopharmaceutical firms will both lose protections already granted under U.S. law, and be placed at a competitive disadvantage to foreign, particularly European, biologics manufacturers. That's because the European Union (EU) has enacted a 10-year data exclusivity period for both new chemical entities and new biological entities before generic copies or biosimilars can be approved.[144] (The EU provides an eleventh year of data exclusivity for significant new indications that are approved within the first eight years after approval.)[145]

In other words, the United States would become a less attractive location for biopharmaceutical R&D, which would damage the competitiveness of a U.S. biopharmaceutical industry whose global leadership is already under threat, as starkly documented by two reports released in May 2012, ITIF's *Leadership in Decline: Assessing U.S. International Competitiveness in Biomedical Research* and Battelle's *The Biopharmaceutical Research and Development Enterprise: Growth Platforms for Economies*

Around the World. Both reports note that an increasing number of countries are focusing on the biopharmaceutical sector in their economic development, innovation, and science and technology strategies. ITIF's report notes that an increasing number of nations are out-investing the United States as a share of GDP in biomedical research.[146] It finds that U.S. venture capital (VC) investment in biotechnology has fallen by 20 percent since 2007, even as biotechnology venture capital investment in China increased by 319 percent from 2009 to 2010 alone.[147] Battelle's report confirms ITIF's analysis, finding that the U.S. environment for biotechnology innovation is showing signs of relative weakening compared with other nations in such areas as net output, exports, publications, and patents.[148] The message from these reports is that the United States cannot take its leadership in biotechnology for granted. It must both continue to invest heavily in biomedical research, and ensure it enacts and sustains a wide range of public policies—including those regarding tax, talent, and intellectual property issues—to support robust investment in biomedical innovation. Ultimately, if policymakers wish to stimulate innovation in biologic medicine, reducing the already scant potential of reward for developing a biologic is not a persuasive inducement.

To be sure, it is important that citizens worldwide have access to affordable medicines. In this regard, it is worth noting that 98 percent of the drugs on the Essential Medicines List from the World Health Organization (WHO) are already off-patent, including ones treating the largest causes of mortality in developing counties, and also that the Doha Declaration put in place measures to provide access to medicines in case of national health emergencies.[149] But it is also critical that medicines exist to treat a wide variety of diseases and conditions, and that requires substantial investment in biopharmaceutical R&D. If countries wish to stimulate innovation in potentially groundbreaking biologic medicines that hold the promise to tackle some of the most intractable diseases, including cancer and Alzheimer's, they must structure a system that affords innovators fair incentives to invest in biological R&D, while at the same time ensuring reasonable patient access, in developed and developing countries alike, to biologic medicines. As ITIF notes in *Innovation Economics: The Race for Global Advantage*, innovation is in part about balancing the interests of current and future generations.[150] A nation focused only on the present generation would not invest in the future (and conversely, a nation focused only on the future would not invest in the present). And so it is with medicines; while we must be concerned with addressing current challenges with the medicines available today, we must also be concerned with continuing to invest in solutions to diseases and conditions which have not yet been solved. Doing so requires preserving sufficient incentives to invest in biomedical research. As the report *Wealth, Health and International Trade in the 21st Century* concludes, "conferring robust intellectual property rights is, in the pharmaceutical and other technological-development contexts, in the global public's long-term interests. Without adequate mechanisms for directly and indirectly securing the private and public funding of medicines and vaccines, research and development communities across the world will lose future benefits that would far outweigh the development costs involved."[151]

Trade Secret Provisions in the TPP

Trade secrets, or "know-how," are critical to the competitiveness of firms in innovation industries. For example, one estimate placed the value of trade secrets owned by U.S.

companies at $5 trillion.[152] Trade secrets are especially important to startup companies and small business enterprises because, unlike patents, they can be protected without registration or formalities. But once disclosed, trade secrets lose all their value to their owners. So they must be carefully protected, especially as competitors are eager to get access to them and as some foreign governments are becoming adept at forcing the disclosure of sensitive information to advance national policy goals.

In the United States, an informal source of law, the Uniform Trade Secrets Act (USTA), played a vital role in harmonizing the legal protection of trade secrets across the different U.S. states.[153] The USTA is considered informal because it was drafted by a nonprofit law commission that promotes the enactment of uniform acts in areas of state law where harmonization is missing, and desired. States are free to enact the USTA as they see fit, and as of 2013, 47 of 50 U.S. states have done so, as well as the District of Columbia, Puerto Rico, and the U.S. Virgin Islands.[154]

The TPP should require the adoption of a common definition for trade secrets: any information that has economic value (actual or potential), is not generally known to the public, and for which the trade secret owner has taken reasonable measures to keep private.

But of the would-be TPP member countries, Australia, Canada, Malaysia and Singapore have no criminal laws for trade secret disclosure or misappropriation. While Malaysia and Singapore have criminal laws targeting computer-related crimes that encompass some forms of trade secret theft, they unfortunately do not broadly address other forms of trade secret theft. And among the countries that do criminalize trade secret misappropriation or disclosure, the penalties often do not provide sufficient deterrent effect. For example, Peru provides for potential imprisonment of no more than two years while U.S. criminal penalties under the Economic Espionage Act can involve prison terms of up to fifteen years.

To address this issue, the TPP should first require the adoption of a common definition for trade secrets: any information that has economic value (actual or potential), is not generally known to the public, and for which the trade secret owner has taken reasonable measures to keep private. In addition, TPP member countries, including the United States, need to criminalize the willful theft of trade secrets across their entire markets. The law should make the misappropriation of a trade secret a criminal offense if it is done intending or knowing that: 1) the misappropriation will harm the trade secret owner; 2) the misappropriation will benefit any government, instrumentality, or agent; or 3) the person who misappropriates the trade secret attempts to aid or abet another person with the trade secret.

Further, some governments have conditioned the approval of FDI, joint ventures, or the sale of certain ICT products on the disclosure of confidential information, including trade secrets. Information required for submission to authorities as part of these countries' product certification or licensing programs (which typically lack robust procedures to protect the information) often includes source code, product content, and design information—all highly proprietary "know how." Accordingly, the TPP Agreement should include language that prevents TPP parties from pressuring foreign companies to "disclose sensitive information as a requirement for setting up a joint venture" or "as a condition of investing."[155] Further, the TPP should build on the product certification provisions included in Section 9 of the Korea-United States Trade Agreement (KORUS) and Article 5

of the WTO Agreement on Technical Barriers to Trade, by placing the burden on TPP parties to clearly and thoroughly justify the submission of trade secrets as part of their product approval requirements. This approach would minimize unnecessary demands for trade secrets as a condition of market access, while ensuring that any justified demands are coupled with the right of affected business entities to promptly appeal the request for such information to a separate regulatory body.

CONCLUSION

The TPP holds the potential to represent a transformative model trade agreement that charts the path for future trade agreements that are more comprehensive than current WTO-based agreements and that have stronger enforcement mechanisms. To achieve that vision, the TPP will have to include—and hold the nations that sign it—to the very highest standards, including strengthened intellectual property rights protection; liberalized trade in services; removal of barriers to foreign direct investment/ownership; prohibitions against the use of localization barriers to trade; elimination of a host of other NTBs, including standards manipulation; transparency and openness in government procurement practices; restrictions on preferential treatment toward state-owned enterprises; and substantial conventional tariff reduction.

In addition, the TPP needs to have to enforcement mechanisms. The expanded interest in the TPP provided by several Asian-Pacific countries, such as China and South Korea, points to the necessity of developing a strict standard by which to punish member countries that choose to not live up to their commitments after joining the agreement. Currently, most laws are rooted in WTO Dispute Settlement Mechanisms, with provisions being included to force parties to the negotiating table when a problem arises. However, new membership should be conditional on countries acceding to a mutually agreed upon set of standards, similar to the manner in which countries must complete certain objectives in order to join the WTO. These can include a minimal level of trade liberalization, and perhaps participation on a provisional "observer" basis prior to full membership. Furthermore, the U.S. Trade Representative (USTR), as well as the trade enforcement agencies in the other TPP member nations, need to receive more resources in order to make sure they can execute the TPP to the highest standard and initiate investigations of possible agreement infractions. Finally, those companies that bring possible infractions to the attention of trade enforcement agencies, whether in the United States or elsewhere, should be allowed to receive a tax credit for all expenditures made related to bringing such cases before the USTR (or the relevant trade enforcement agency).

More generally, both current TPP parties and any invited in the future must eschew mercantilist practices and demonstrate genuine commitment to market-based trade. As this report has shown, the combination of market-based free trade and robust intellectual property rights is a powerful driver of innovation that spurs development of novel products and services to improve the quality of life and standards of living for citizens worldwide. That is the promise of the TPP.

To be sure, the Obama Administration understandably desires to score a quick win on trade, especially in the context of growing the global innovation economy. However,

despite the TPP's exigency, it is most important to get the TPP right. The Administration's trade negotiators should insist that the TPP truly be a twenty-first century agreement that includes the highest levels of IPR protection, transparency in government procurement practices, removal of NTBs, comprehensive market access provisions, and stringent enforcement mechanisms. That's the best way to ensure that the United States' long-term strategic and economic interests are realized. If the Trans-Pacific Partnership ends up being anything less than a gold-standard trade agreement, the United States should decline to join.

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