January 22, 2016

Secretary, United States International Trade Commission
500 E Street SW
Washington, DC 20436

Re: Post-Hearing Brief in Response to Investigation No. TPA-105-001

"Trans-Pacific Partnership Agreement: Likely Impact on the U.S. Economy and on Specific Industry Sectors"

The Semiconductor Industry Association (SIA) thanks the ITC for the opportunity to appear at the January 13th Public Hearing on the impact of the Trans-Pacific Partnership Agreement (TPP), and submits the following post-hearing brief:

I. Introduction

The Semiconductor Industry Association (SIA) is the voice of the U.S. semiconductor industry, one of America's top export industries and a key driver of America's economic strength, national security, and global competitiveness. For U.S. semiconductor companies -which design and manufacture the microchips that control all modern electronics- international trade is vital for our industry to compete, innovate and grow.

This is because while most of the manufacturing done by U.S. semiconductor companies is done in the United States, 82% of our products are sold to customers overseas. In fact, semiconductors are the nation's 3rd largest manufactured goods export, after automobiles and airplanes. The semiconductor industry's employment of nearly 250,000 people in high-skilled, high-wage jobs in the United States, and the one million additional U.S. jobs supported by our industry, are thus created and supported by free trade.

The TPP is incredibly important to our industry in three main aspects: 1) it enhances access to the large and growing global markets in Asia 2) it strengthens the global semiconductor supply chain on which our industry depends and 3) it aligns global trade rules with how trade is done in today's digital economy and sends an important message to our competitors that fairness and collaboration – not discrimination and protectionism- will be the hallmarks of 21st century trade.

This last point is incredibly important in relation to the challenges our industry faces in China. China, the largest single-country market for semiconductors, has long pursued a policy of indigenous innovation and protectionism that challenges the free and open trading system supported by the United States and its global partners. Several other major economies are beginning to follow China's lead in adopting protectionist policies, creating a global struggle over which model of trade will prevail: the WTO-based model of free and open markets, or a China-led model of state-owned industrial policy and protectionist measures?

We are thus at a critical juncture in global trade. The TPP, if successfully ratified, will preserve and strengthen the WTO-based model of free and open markets, to the immense benefit of U.S. companies. When the playing field is level, U.S. semiconductor companies can successfully compete and win. The TPP is thus an essential foundation for continued U.S. economic and technological leadership.

II. The TPP enhances access to Asia-Pacific Markets. More Trade = More Growth

The importance of the huge and growing markets of the Asia-Pacific to U.S. semiconductor companies cannot be overstated. U.S. exports of semiconductors to TPP countries accounted for 41% of total U.S. semiconductor exports to the world in 2014 ($17 billion). U.S. semiconductor exports to the broader Asia-Pacific region represent 85 percent of total U.S. semiconductor goods exports to the world ($36.5 billion in 2014).

Moreover, the Asia-Pacific export market is the fastest growing market vis-à-vis the world. U.S. semiconductor export growth to the TPP countries since the global economic recession in 2008 has grown faster than U.S. semiconductor export growth to the world during this same time period. From 2009 to 2014 U.S. semiconductor exports grew by 17.2 percent to the TPP countries, while it increased by 12.1 percent to the world.[1]

Additionally, Asian economies are forecast to grow faster over the next two years than any other global regions and the world in general. According to the International Monetary Fund (IMF), emerging and developing Asia is forecast to grow annually by 6.3 and 6.2 percent in 2016 and 2017, respectively.[2] This compares to total global annual economic growth of only 3.4 and 3.6 percent in 2016 and 2017.

[1] Official U.S. government trade data. USITC dataweb.
[2] International Monetary Fund, *World Economic Outlook, January 2016*, found at: http://www.imf.org/external/pubs/ft/weo/2016/update/01/.

Not only is the Asia-Pacific region already important to the U.S. semiconductor industry in terms of end markets, but it also is the market with the most opportunity for future semiconductor industry growth.

By eliminating tariffs and non-tariff barriers, the TPP provides even greater access to this important Asia-Pacific market. More trade equals more growth for our industry, which in turn generates the revenues necessary to heavily invest in R&D to keep our companies at the technology forefront.

III. The TPP strengthens the global semiconductor supply chain

The semiconductor industry is one of the most global industries in the world. The semiconductor supply chain and ecosystem- from raw materials, to research and design, to manufacturing, to assembly, packaging and testing, and finally to distribution- are spread across the globe.

While U.S. companies manufacture the majority of semiconductors in the United States, they rely on the global supply chain for raw materials, manufacturing equipment, and assembly/testing and packaging. TPP countries are a very important part of this global supply chain, with Japan, Malaysia, Singapore, and Vietnam specializing in the diverse segments that make up the semiconductor ecosystem. Also, many U.S. semiconductor firms have significant design, manufacturing, R&D and other services footprints in these countries, as well as in Canada and Mexico

TPP provisions such as tariff elimination on semiconductor-rich applications (i.e. autos and auto parts), simplification and harmonization of customs and trade procedures, regulatory coherence, removal of impediments to e-commerce, and requirements to eliminate tariffs on tech products strengthen the semiconductor supply chain and better enable companies to achieve efficiency, lower costs, and reduce risks.

IV. The TPP aligns global trade rules with 21st century trade

The TPP sets the rules for cross-cutting issues not previously included in trade agreements that will set important precedents for other trading partners, particularly China. Key provisions that will positively impact the U.S. semiconductor industry include:

1. Rules preventing market-access restrictions on commercial products with cryptography
2. New procedural safeguards and increased penalties to protect trade secrets and other forms of IP.
3. Tariff elimination on semiconductor-rich products and applications (i.e. autos/auto parts)
4. Simplification and harmonization of customs and trade procedures to make regulatory systems of trading partners more compatible and remove impediments to e-commerce
5. Commitments ensuring state-owned enterprises compete fairly and transparently without undue government advantage
6. Requirements to ensure cross-border data flows
7. Rules against localization requirements for computer infrastructure
8. Non-discriminatory treatment of electronically transmitted digital products.

A. Impact of Rules on Commercial Cryptography

The TPP contains provisions in the market access and TBT ICT Annex that generally prohibits restrictions on the import, use and sale of commercial cryptographic goods – a new requirement never before applied in a trade agreement. Specifically, the TPP prohibits Parties from imposing discriminatory restrictions on commercial products with encryption, such as requirements to turn over proprietary information as condition of market access, to partner with a domestic entity, or to use a particular technology or standard.

Given the ubiquity of commercial encryption in everyday technology products to protect and secure personal information, data transfer and on-line services, mitigating against the adoption of restrictive policies (i.e. in Vietnam, China, and India), will protect trade flows of semiconductors and other ICT products on the scale of hundreds of billions of dollars.

Most TPP parties, including the United States, do not restrict or regulate commercial cryptographic goods in recognition that such restrictions cause more harm than benefit given their widespread use. Vietnam is the only TPP party with restrictions on commercial encryption, as detailed in their "Law on Network Information Security" recently passed by the National Assembly on November 19, 2015 and which will take effect on July 1, 2016. [3] If the TPP is ratified, Vietnam will have to amend the overbroad restrictions on the importation and sale of

[3] On November 19, 2015, the Vietnam National Assembly passed the Law on Network Information Security. Problematic provisions in this law include requirements to obtain a business license to sell or import products with "civil" cryptography. As part of the business license application requirements, companies must submit a "technical plan, including documentations of technical specification and parameters of products." The law also requires providing state bodies with necessary information relating to passwords.

commercial cryptography, which currently threatens a substantial amount of semiconductor and ICT trade flows into Vietnam.

In 2011, Vietnam imported $3.7 billion worth of semiconductors, and $10.9 billion in ICT products.[4] Encryption is inseparable from semiconductors. In addition to chips whose specific function is to provide encryption, general-purpose microprocessors, memory chips, discretes and analog chips are intended for use as part of a system that contains encryption functions in some way, although not as its primary function. Likewise, virtually all ICT products (computers and peripheral equipment, communications equipment, mobile phones, video games, etc) contain encryption in some form, or are part of a product that contains encryption.

Given this ubiquity, it is estimated that the majority of semiconductor imports ($3.3-3.7 billion) and 50- 90% of ICT imports (up to $9.8 billion) could be affected by encryption regulations in Vietnam alone.

The greater impact of the TPP provisions on encryption is the important precedent it sets for non-TPP trade partners, particularly China and India, which are rapidly adopting broad and discriminatory regulation of commercial encryption to support indigenous innovation efforts. For a country like China, restrictions on commercial encryption could potentially affect imports valued in the hundreds of billions of dollars.

Table 1: Rough estimates of semiconductor trade affected by encryption policies[5]

Country	Import values	Proportion affected	Affected imports
Vietnam	$3.7 billion	90%+	$3.3 billion
China	$188.4 billion		$169.6 billion
India	$3.4 billion		$3.1 billion
Russia	$0.7 billion		$0.6 billion

Table 2: Rough estimates of ICT product trade affected by encryption policies[6]

Country	Import values	Proportion affected	Affected imports
Vietnam	$10.9 billion	50-90%	Up to $9.8 billion
China	$266.0 billion		Up to $239.4 billion
India	$25.9 billion		Up to $23.3 billion
Russia	$23.7 billion		Up to $21.3 billion

[4] Based on publicly available trade data and a definition of "ICT products" adopted by the OECD in 2008.
[5] "Semiconductor trade" refers to UN Comtrade trade data for HS codes 8541 & 8542; data 2011 for Vietnam, 2012 for China, India and Russia.
[6] "ICT product trade" refers to UN Comtrade trade data based on definition in OECD (2009), with concordance to HS 2007 categories provided in OECD (2010); data 2011 for Vietnam, 2012 for China, India and Russia.

Additionally, there are a variety of other costs associated with commercial encryption trade restrictions that are prevented by the new TPP rules. These associated costs include costs to modify, redesign, and/or certify products to meet country-specific technology mandates and standards; time delay costs due to compliance with burdensome and expensive conformity assessments; and potential costs from unauthorized disclosure (both unintentional and intentional) by governments requiring intellectual property disclosure during the assessment process. These costs introduce the risk of either crippling damage to business interests or forcing companies to abandon certain markets and market opportunities altogether.

The potential economic impact of restrictive commercial encryption policies is severe, threatening trade in such products on the scale of tens to hundreds of billions of dollars. The TPP provision on commercial cryptographic goods is an extremely important step in mitigating this risk. Similar provisions should be pursued in all future U.S. trade agreements to ensure that rules governing the use and trade of commercial encryption products do not unfairly impede the trade of semiconductors and the ICT products that depend on them.

B. New procedural safeguards and increased penalties to protect trade secrets and other forms of IP.

Trade secrets are a critical and major asset of U.S. semiconductor companies, and are essential to their technological progress and competitiveness. Semiconductor companies typically spend 15-20 percent of revenue on research and development (R&D), making intellectual property protection and enforcement of utmost importance to our industry. In 2014, U.S. semiconductor companies invested $35 billion in R&D, totaling 18% percent of their total sales, one of the highest rates of any industry, on par with the biopharmaceutical industry.

Usually, a trade secret in the semiconductor industry has a short lifecycle owing to the rapid pace of technological development and upgrade. Once it is stolen, the company may lose its competitive advantage and its market share could be jeopardized.

The provision in the TPP to require criminal penalties for trade secret theft, including via means of cyber theft, is therefore very important to the U.S. semiconductor industry, and is in line with World Semiconductor Council recommendations on "Core Elements for Trade Secret Protection Legislation[7]. This provision is also important in setting a new standard for the world's most egregious perpetrators of trade secret theft, especially China.

[7] JOINT STATEMENT OF THE 19TH MEETING OF THE WORLD SEMICONDUCTOR COUNCIL (WSC), 21 MAY, 2015 (HANGZHOU, CHINA),

C. Ground-breaking tariff reductions on semiconductor-rich products and applications (i.e. autos/auto parts)

The TPP reduces tariffs on over 18,000 product lines, an extraordinary step in promoting a free and open market. These tariff cuts include products that are rich in semiconductor content, including autos, auto parts, consumer electronics, motors and industrial machinery. Lower consumer prices and lower costs of trade for products incorporating semiconductors will in turn promote U.S. semiconductor sales and growth. Moreover, the TPP requires each Party to be a participant in the WTO Information Technology Agreement (ITA), an important trade pact that eliminates duties on high-tech goods, including semiconductors. Even without this provision, the high-tech product lines covered in the TPP overlap and even exceed the product coverage in the expanded ITA agreement, thus making the TPP just as impactful as the landmark ITA expansion agreement in eliminating tariffs on high-tech goods. By virtue of being TPP Parties, non-ITA expansion signatories such as Brunei, Chile, Mexico and Vietnam will also eliminate tariffs on high-tech goods.

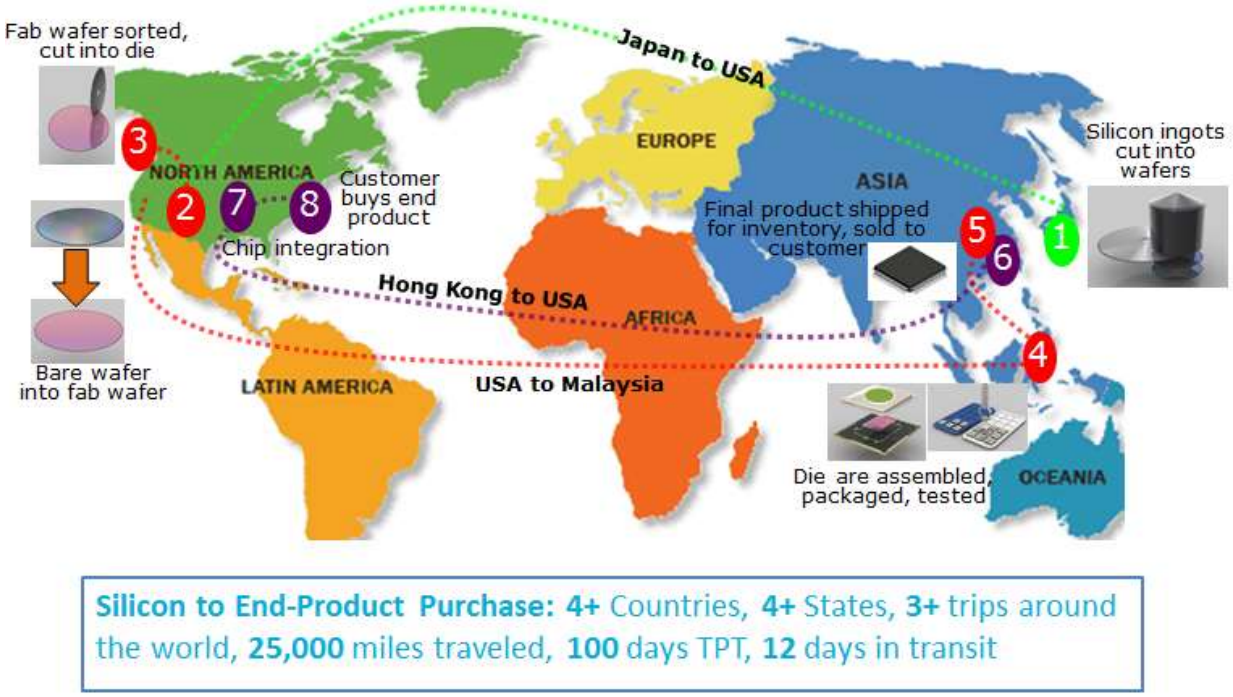
D. Simplification and harmonization of customs and trade procedures to make regulatory systems of trading partners more compatible and remove impediments to e-commerce

As described above, the semiconductor industry is one of the most global industries in the world. The semiconductor supply chain and ecosystem- from raw materials, to research and design, to manufacturing, to assembly, packaging and testing, and finally to distribution- are spread across the globe. The journey of a chip, from silicon to incorporation into an end-product, typically involves four or more countries. TPP Parties such as Japan, Malaysia, Singapore, and Vietnam are key players in this global supply chain, along with many other Asia-Pacific countries.

The spread of the industry across the world has greatly contributed to the growth of U.S. semiconductor companies as it enables them to globally source technology, equipment, services, R&D, and capabilities on a scale never before thought possible. The global nature of the industry also promotes growth via access to international networks and global markets – especially the fast growing Asia-Pacific markets- and facilitates rapid innovation and lower costs for consumers as the relative technological skill and cost advantages of countries are leveraged.

Being so global in nature, the simplification and harmonization of customs and trade procedures, regulatory coherence, removal of impediments to e-commerce, and protection of cross-border data flows is very important to the semiconductor industry. These measures help strengthen the global semiconductor supply chain and ecosystem, and better enable companies to achieve efficiency, lower costs, and reduce risks.

Figure 2: Example of Semiconductor Product Global Manufacturing Process



E. Commitments ensuring state-owned enterprises (SOEs) compete fairly and transparently without undue government advantage

The U.S. semiconductor industry has a long history of battling the effects of market and trade distortions caused by foreign government subsidies, intervention, discriminatory investment requirements, and other non-competitive behavior that advantages SOEs and national champions. When a private company is competing directly against a government, the playing field is certainly not level. SIA firmly believes that the competitiveness of companies and their products, not the intervention of governments and authorities, should be the principle determinant of industrial success and international trade.

The TPP provisions on SOEs are an important step in achieving this objective. In the TPP, Parties must ensure that their SOEs make commercial purchases and sales on the basis of commercial considerations, and that SOEs do not discriminate against another Party's companies. The investment chapter also includes obligations that prevent discriminatory measures that advantage domestic SOEs and force foreign investors to favor another country's domestic technology, a common "forced localization" tactic. The following TPP provisions are incredibly important to the semiconductor industry:

- Bans on specified "performance requirements," including local content requirements, export requirements, and technology transfer or technology localization requirements.
- Clarifications that TPP investment disciplines apply to SOEs and other persons exercising delegated government. This will prevent SOEs, acting on behalf of governments, to take actions that discriminate against foreign investors and then evade challenge by asserting they are not covered by the disciplines of the agreement.
- Rules requiring Parties to ensure that administrative bodies regulating both SOEs and private companies do so in an impartial manner and do not use their regulatory authority to provide preferential treatment to their SOEs.

These rules provide a solid foundation to combat the market and trade distorting effects of SOE activity based on government influence, rather than commercial considerations. These distortions are none more apparent than in China, which is implementing an industrial development program to build a domestic semiconductor industry. This program is backed by billions of dollars in investments – predominantly in state-owned "national champions", and a range of preferential policies, including procurement.

The National IC Promotion Guidelines, released in June 2014, calls for public and SOE procurement decisions in sectors such as telecommunications and internet service providers (major consumers of ICs) to be "based on projects aimed at expanding domestic demand" and "based on secure and reliable" software and hardware products.

While China is not a member of the TPP, the new SOE disciplines in the TPP set an important precedent for dealing with the harmful trade and investment distortions that SOEs can cause.

V. Conclusion

The TPP is an incredibly important agreement as it will essentially determine the future of the global trading system. If successfully ratified, the TPP will preserve and strengthen the global model of free and open markets, to the immense benefit of U.S. companies and its global partners. If the TPP fails, U.S. leadership in global trade will be severely weakened, as will the ability of companies to compete in international markets on a level playing field.

The TPP would promote free trade, reaffirm America's global technology and trade leadership, and ensure that more products made in America – including tech products like semiconductors – can be shipped to customers around the world. SIA urges congressional approval of TPP this year and looks forward to working with Congress and the Administration as the process moves forward.