Before the Office of the United States Trade Representative and the United States Department of Commerce

In the Matter of Executive Order 13786 of March 31, 2017
Omnibus Report on Significant Trade Deficits
82 Fed. Reg. 18,110 (April 17, 2017)

Submitted May 10, 2017

Written Comments from the Semiconductor Industry Association

The Semiconductor Industry Association (SIA)[1] welcomes the opportunity to provide written comments in the matter of Executive Order 13786 ("Trade Deficits Notice"), Omnibus report on Significant Trade Deficits.

Semiconductors are one of our country's top exports, and the United States has consistently maintained an overall trade surplus in semiconductors for the past 20 years.[2] In 2016, the United States maintained a $6.4 billion trade surplus in semiconductors. In fact, in 2016 the United States maintained a $1.1 billion trade surplus with the Trade Deficits Notice 13 countries combined. Importantly, for those countries identified in the Federal Register Notice related to Executive Order 13786 with which it appears the United States may have a bilateral trade deficit in semiconductors, a closer look at the data shows that any apparent deficit is due to structural, not mercantilist reasons. In fact, in many cases, these "deficits" would be trade surpluses if bilateral trade were measured on a value-added basis.

In addition, the U.S. trade surplus in semiconductors is likely understated. **Because of the uniquely global and disaggregated nature of semiconductor design, development, and production, the U.S. trade balance may be a misleading metric for determining the**

[1] 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. Semiconductor innovations form the foundation for America's high-tech sector affecting millions of U.S. workers. Founded in 1977 by five microelectronics pioneers, SIA seeks to strengthen U.S. leadership in semiconductor manufacturing, design, and research by working with the Administration, Congress, and other key industry stakeholders to encourage policies and regulations that fuel innovation, propel business and drive international competition to maintain a thriving semiconductor industry in the United States. More information about SIA is available at www.semiconductors.org.

[2] The last year the Unites States had a trade deficit in semiconductors was 1996. From the mid-1980s to the mid-1990s, the U.S. semiconductor industry was engaged in an intense struggle with the Japanese semiconductor industry for market share leadership. In 1996, the U.S. trade deficit in semiconductors with Japan was the largest with any country, and Japan was the leading country source of U.S. semiconductor imports, reflecting the strength of the Japanese semiconductor industry at the time.

competitiveness of the U.S semiconductor industry. U.S. trade statistics such as bilateral trade balance data may distort or omit where value is added in the overall global semiconductor manufacturing process. For instance, semiconductor design – the first stage of semiconductor production – is a high-value added step in the process and the U.S. semiconductor industry is the leader in chip design. But this critical step, which adds as much as an estimated 45 percent of the value of the semiconductor, is not captured at all in goods trade data. Also, much of the value of U.S. imports of semiconductors is created in an initial stage of production often in the United States by U.S. semiconductor firms. This highly innovative stage of production known as "front-end fabrication" can create an estimated additional 45 percent of value to a semiconductor. This means that when such semiconductors are imported into the United States as final product to be sold in the U.S. market, only an estimated 10 percent of their value was created overseas.

While the U.S. semiconductor industry currently remains the global leader in industry market share and competitiveness, this position is not a given. For example, unfair practices limiting U.S. industry access to foreign markets coupled with significant foreign government subsidization of their respective semiconductor industries to promote U.S. imports could lead to a loss of global competitiveness. Unfair trade practices could take various forms, for example discriminatory domestic standards and foreign government attempts to force or induce the transfer of critical design, development, and manufacturing technology. Under such scenarios, the resulting trade deficit would inevitably be one based on a loss of U.S. industry competitiveness. It is important, therefore, that **the United States enhance the competitiveness of its semiconductor industry as well as curb unfair trade practices.** The United States cannot afford to have happen to its semiconductor industry what happened to some other U.S. industries, such as the solar, wind turbine, and LED industries.

I. Semiconductors and the U.S. Semiconductor Industry

Semiconductor "chips" are the brains of modern electronics, enabling advances in communications, computing, health care, military systems, transportation, and countless other commercial and non-commercial applications. Indeed, semiconductors are critical components in a staggering variety of products, from smaller computers and smart phones to safer automobiles and navigation systems. Semiconductors make the world around us smarter, greener, safer, and more efficient. The U.S. semiconductor industry is America's number one contributor to labor productivity growth, as semiconductor technology has made virtually all sectors of the U.S. economy – from farming to manufacturing – more effective and efficient. Semiconductors form the backbone of our critical defense, intelligence, telecommunications and transportation infrastructure and are vital to both the nation's security and economic growth and productivity.

The U.S. semiconductor industry is the worldwide industry leader; U.S. companies command about half of global market share through sales of $164 billion in 2016. The U.S. industry has sustained this leadership position for nearly two decades. Semiconductors are America's number four export product after airplanes, refined oil, and automobiles, and more than 80 percent of U.S. semiconductor companies' sales are to overseas customers. The U.S. semiconductor industry directly employs nearly a quarter of a million people in the United States and supports more than a million additional jobs throughout the U.S. economy. In addition, the U.S. semiconductor industry is one of the world's most advanced manufacturing sectors. Nearly half of U.S. semiconductor companies' manufacturing base is in the United States, and 21 U.S. states are home to major semiconductor manufacturing facilities. The U.S. semiconductor industry is highly research and development (R&D) intensive with the industry annually reinvesting about one-fifth of revenue back into R&D, the second highest share of any U.S. industry in 2016.[3] U.S. industry consortia also funds innovative precompetitive basic research at over 80 American universities.

II. U.S. Government Trade Data Show the U.S. Currently Has a Trade Surplus in Semiconductors, As It Consistently Has Had for the Past 20 Years

Reflecting our industry's strong industrial base and technological leadership position, the United States has consistently maintained an overall trade surplus in semiconductors for the past 20 years.[4] Also, the United States maintains a semiconductor trade surplus with the 13 countries combined identified in the Federal Register Notice and current bilateral semiconductor trade surpluses with 6 of the 13 countries identified in the Federal Register Notice.[5] Finally, for those countries identified in the Federal Register Notice where the United States has a current bilateral trade deficit in semiconductors, these are due to structural industry and supply chain factors instead of mercantilist reasons, and in many cases these deficits would be trade surpluses if bilateral trade were measured on a value-added basis. While the U.S. trade surplus in semiconductors was greater a decade ago, the slightly decreased surplus has been due to increased U.S. imports to satisfy a growing U.S. market rather than decreased U.S. exports which have remained stable, reflecting a stable domestic manufacturing base. In addition, over the past 5 years, the trade surplus has stabilized between $6 and 8 billion annually.

A. LEDs and Solar Products Should Not Be Included in the Semiconductor Trade Balance

The U.S. Census Bureau's North American Industry Classification System (NAICS) statistical code 334413 is defined as "*Semiconductor and Related Device Manufacturing*" and it is the code that most closely reflects the products manufactured by the U.S. semiconductor industry. However, this code also includes a few significant products that should not be included in the trade deficit analysis, because they serve distinctly separate markets and are made by different industries. These products include solar cells made for solar modules and panels, LEDs, and some raw materials used in semiconductor manufacturing.[6]

For many years, U.S. imports in these statistical subcategories amounted to a rounding error in the overall trade import and trade balance numbers for NAICS 334413. However, over the past 4-7 years, very high levels of U.S. imports of solar products have entered the United States, while U.S. exports of solar products have dramatically decreased over the same timeframe. This shift in U.S. trade in solar products directly relates to the great loss of competitiveness of

[3] Other countries' semiconductor industries are also highly R&D intensive (though the U.S. semiconductor industry is the most R&D intensive comparatively), indicating the resolve of global semiconductor firms to compete for innovation leadership.
[4] For the purposes of defining semiconductors in the context of trade statistics, SIA includes all Harmonized Tariff Schedule (HTS) subheadings that concord with NAICS code 334413, defined as "semiconductor and related device manufacturing" with the exception of 5 HTS subheadings which do not provide for trade of semiconductor products, products produced by semiconductor firms, or products that have the same end use or customer base as semiconductors. These five HTS subheadings are: 3818000010, 3818000090, 8541402000, 8541406020, 8541406030. For a detailed description of these five products and the list of all HTS subheadings that define trade in semiconductors, please see Annex 2, Exhibits 1 and 2.
[5] In 2016, the United States maintained a trade surplus in semiconductors with Canada, China, India, Mexico, South Korea, and Thailand. See Annex 1.
[6] See Annex 2, Exhibit 1.

the U.S. solar industry and the shift of solar production to foreign competitors abroad, while at the same time domestic demand for solar products saw a major increase, leading to an accompanying spike in U.S. imports of these products.

Clearly, a solar cell destined for a roof-top panel is fundamentally different than an integrated circuit or discrete transistor destined for a cell phone or other electronics product. Therefore, to accurately calculate U.S. semiconductor trade balances, especially over the past few years, it is essential to exclude trade in these sub-products in the trade balance calculation. When properly segmented to include solely trade in semiconductor products, the result is a current overall trade surplus in semiconductors for 2016 of $6.4 billion, a current U.S. trade surplus with the 13 countries identified in the Federal Register Notice in semiconductors for 2016 of $1.1 billion, and current bilateral U.S. trade surpluses with 6 of the 13 countries identified in the Federal Register Notice.[7]

B. Semiconductors Are a Highly-Traded Product that Have a Complex Manufacturing Supply Chain

Free trade in semiconductors is important for promoting the smoothly functioning global semiconductor manufacturing process as well as enabling U.S. semiconductors to reach all global markets. Because semiconductors are small, light, and relatively easy to transport and are virtually tariff-free around the world, they are easily traded. Semiconductors are a major U.S. export product because a significant amount of semiconductor manufacturing is conducted in the United States, and sales of semiconductors outside of the United States account for over 80 percent of all U.S. semiconductor industry sales. Those overseas sales provide critical revenue that is then used to fund R&D and advanced manufacturing here in the United States.

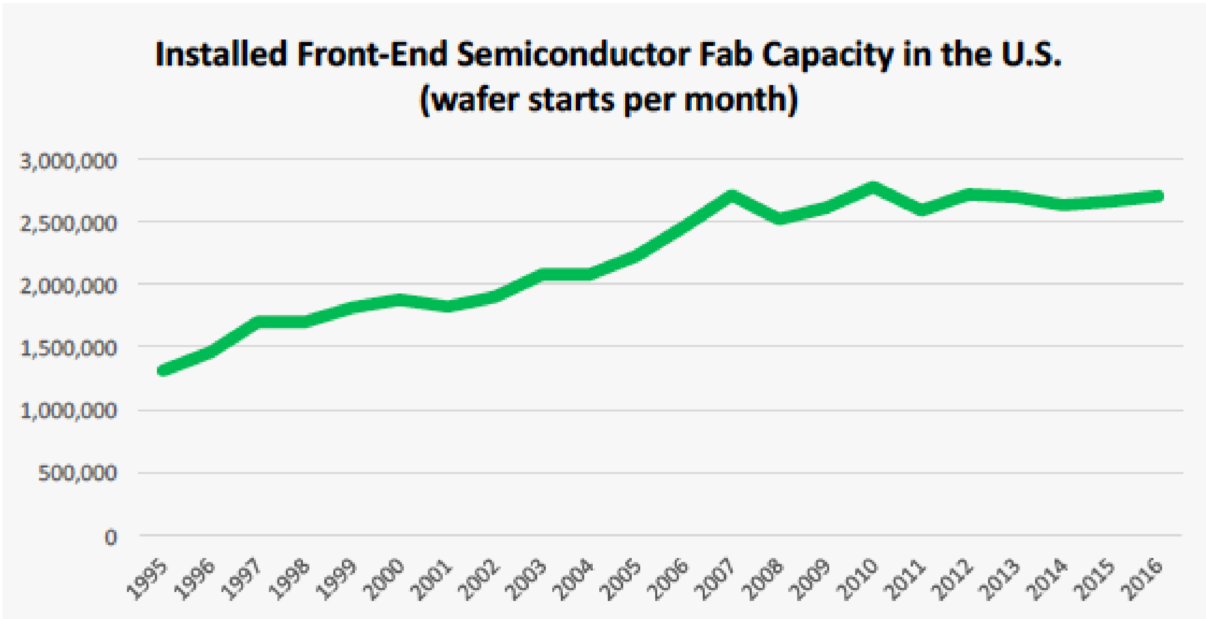
In addition, semi-finished semiconductors are often exported from the United States to undergo the last, and least value-additive, and most cost-sensitive stage of production, a step known as assembly, test, and packaging (ATP). Semiconductors are often imported into the United States because it is the second-largest, single-country market in the world for semiconductors, and ATP facilities are commonly located abroad, thereby requiring U.S. demand for semiconductors to be satisfied by U.S. imports. However, in many cases most the value of these imports was created in the United States through design, development, or front-end manufacturing.

C. The U.S. Semiconductor Industry Has a Stable Domestic Manufacturing Base that Contributes to Stable Levels of Domestic Shipments and U.S. Exports

Unlike other manufacturing industries and especially unlike the broader electronics sector, the U.S. semiconductor manufacturing base has remained remarkably stable over the past 20 years. Front-end semiconductor fabrication capacity in the United States has steadily increased over the past several years, with major fabrication facilities located in over 21 states. See table 1 below:

[7] See Annex 1.

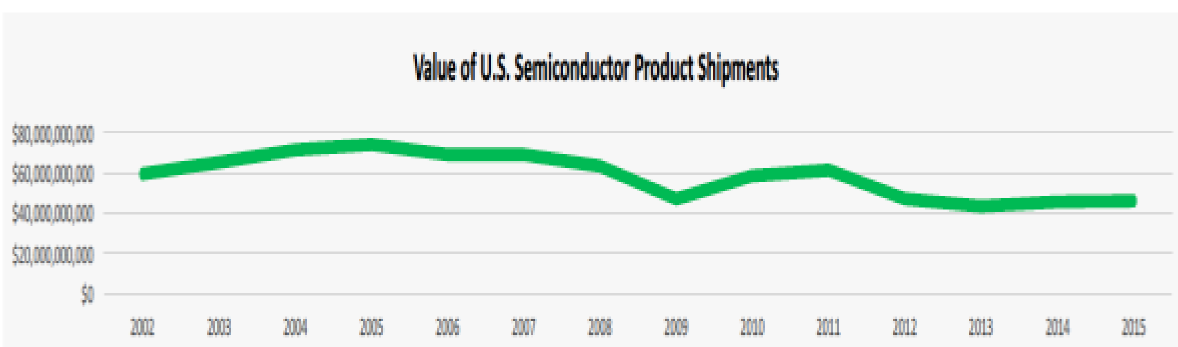
Table 1



Source: SEMI, World Fab Watch, Status 03/2016.
Note: Monthly wafer start capacity is normalized to 8-inch equivalent wafers.

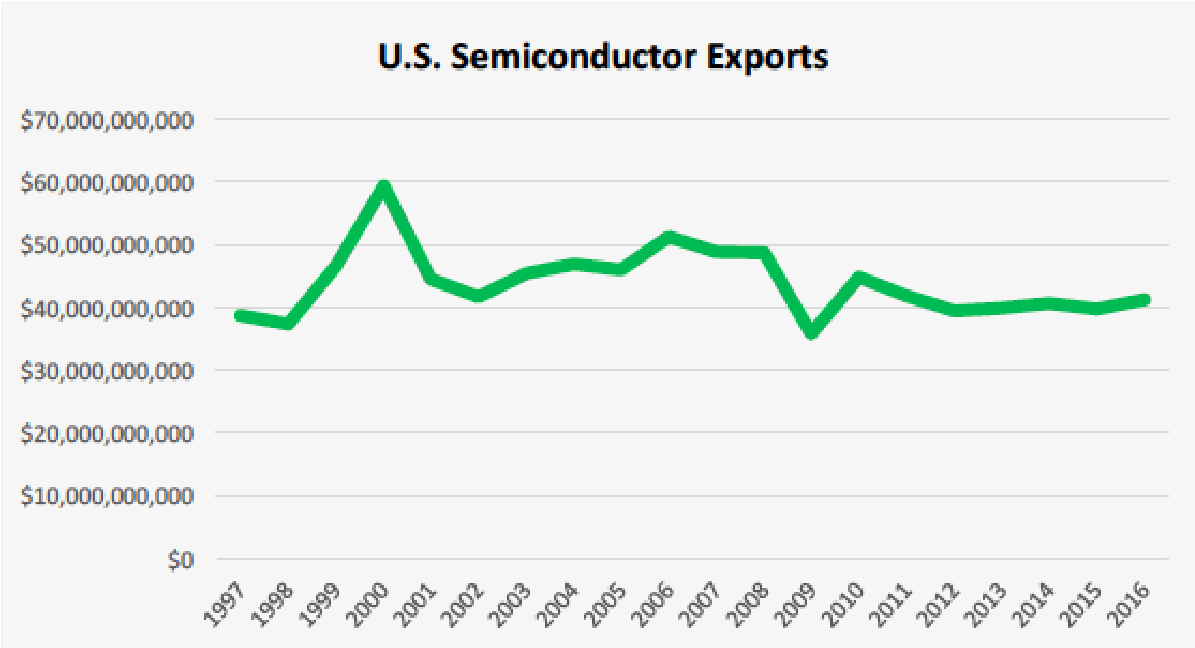
Nearly half of the semiconductor manufacturing industrial base of U.S.-headquartered firms is located in the United Sates. Some of these front-end fabrication facilities known as "fabs" operate at the leading edge of semiconductor manufacturing technology and innovation, producing semiconductors at the smallest feature size, currently 14 nanometers and below. The stability in the level of domestic U.S. semiconductor capacity has therefore led to stable levels of domestic semiconductor shipments and exports. See tables 2 and 3 below. Over the past several years, shifts in the U.S. semiconductor trade balance have been impacted more by increases in U.S. imports to satisfy a growing U.S. domestic market than by a decrease in U.S. exports.

Table 2



Source: U.S. Department of Commerce, U.S. Census. American Annual Survey of Manufacturers. Industry defined by NAICS code: 334413 (Semiconductors).

Table 3



Source: Official U.S. government trade data, U.S. Department of Commerce, obtained from the U.S. International Trade Commission, Dataweb: https://dataweb.usitc.gov/.

D. The U.S. May Have Trade Deficits with Some Countries, But Those Deficits are Structural, Due Mainly to Industry Global Value Chains that in Many Cases Add to the Competitiveness of U.S. Firms

According to bilateral semiconductor trade balance data from 2016, 7 of the 13 countries identified in the executive order have a bilateral trade deficit in semiconductors. But these bilateral trade deficits are generally structural, due mainly to industry global value chains that in many cases add to the competitiveness of U.S. firms. For instance, since the 1970's East and Southeast Asian countries like Taiwan and Malaysia have been the home to many assembly, test, and packaging (ATP) facilities of U.S. headquartered firms. For countries such as these with which the United States trades in semiconductors, often the majority of the value added to the semiconductor (such as semiconductor design and front-end fabrication) is conducted in earlier stages of production in another country, often in the United States. By taking advantage of such offshore test and assembly, U.S. semiconductor firms have been able to maintain market share leadership in this highly competitive industry for the past 20 years.[8] More insular industries, such as the semiconductor industry in Japan, have chosen to locate most of their entire production processes domestically, and as a consequence have not maintained their competitiveness and are in decline.

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[8] For a deeper understanding of the global nature of the semiconductor value chain and how the U.S. semiconductor industry has taken advantage of it to remain the global market share leader, please refer to the report by Nathan Associates entitled, "Beyond Borders, the Global Semiconductor Value Chain: How an Interconnected Industry Promotes Innovation and Growth." Found online at: https://www.semiconductors.org/clientuploads/Trade%20and%20IP/SIA%20-%20Beyond%20Borders%20Report%20-%20FINAL%20May%206.pdf.

III. The U.S. Trade Surplus in Semiconductors is Likely Understated

The U.S. trade balance is not the best metric for determining the competitiveness of the U.S semiconductor industry. The semiconductor fabrication process includes three distinct stages of production – design and development; front-end fabrication; and back-end assembly, test, and packaging. The making of a semiconductor has evolved to the point where each of these fabrication stages may be performed by either a single integrated company operating globally or by three different semiconductor firms located in three different countries. Given this highly globalized manufacturing ecosystem, trade statistics (including U.S. trade statistics) often distort, cannot factor, or omit where value is created within the semiconductor manufacturing process. For instance, the U.S. trade balance in semiconductors fails to consider the following factors:

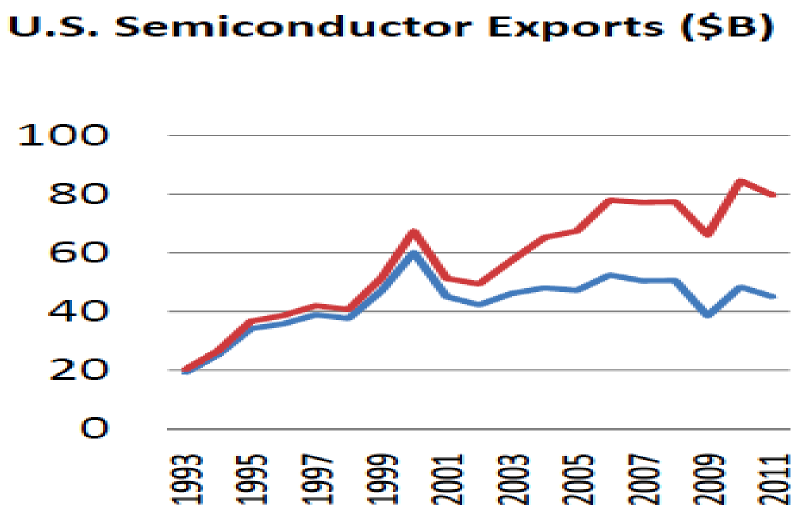
First, the value created in semiconductor design is not captured in semiconductor goods trade – As mentioned earlier, the U.S. semiconductor industry is a leader in semiconductor design capturing nearly two-thirds of the global "fabless" market, and many well-known U.S. semiconductor firms specialize in semiconductor design. These firms, known as fabless firms, conduct the majority of their design work in the United States but contract with firms that are predominantly located abroad to do the front-end and back-end fabrication stages. Therefore, a significant amount of U.S. semiconductor design services is exported annually, but these are not counted in the goods trade data. The U.S. government had proposed and was close to implementing an initiative, known as the *Factoryless Goods Producers* (FGP) initiative, to include types of economic activity such as semiconductor design in its manufacturing data collection for the 2017 Economic Census.[9] Analysis by the U.S. government at the time of consideration of the impact of this initiative on U.S. exports of semiconductors concluded that if semiconductor fabless design activities were included in the manufacturing statistics of the U.S. government, the value of U.S. semiconductor exports would essentially double. See table 4 below:

[9] For background on the FGP Initiative, please see OMB Federal Register Notice (Volume 76, No. 159): https://www.gpo.gov/fdsys/pkg/FR-2011-08-17/pdf/2011-20997.pdf. The initiative was not implemented for the 2017 Economic Census.

Table 4

Effects of Including Fabless in Manufacturing

Source. Author's Estimates



The blue line represents the value of U.S. semiconductor exports, and the red line represents the value of U.S. semiconductor exports when including fabless semiconductor exports

Source: Dr. David Byrne, Principal Economist, Board of Governors of the Federal Reserve System, excerpt from a presentation to the SIA, October 31, 2012.

Note: this work should not be attributed to the Board of Governors of the Federal Reserve System or to other members of its staff.

Given the U.S. fabless industry today continues to maintain leadership in this highly value-additive stage of semiconductor fabrication, there is little doubt the added increase in U.S. semiconductor exports would remain as significant today as it was in 2011.

Second, a significant share of the value of U.S. semiconductor imports is created in the United States in earlier stages of semiconductor production – As stated above, the U.S. semiconductor industry is the worldwide industry leader with about half of global market share in 2016. As the leader in the design stage of production (nearly two-thirds market share) and with nearly half of its front-end fabrication capacity located in the United States, the U.S. semiconductor industry conducts a significant share of the value creation of a semiconductor in the United States. The last and least value-additive stage of production – semiconductor ATP – has historically been conducted overseas since the 1970s, mainly in Asia. This manufacturing dynamic has resulted in U.S. imports of semiconductors where only a small fraction of the value of the imported semiconductor was created in the country from which the product was imported.[10] For example,

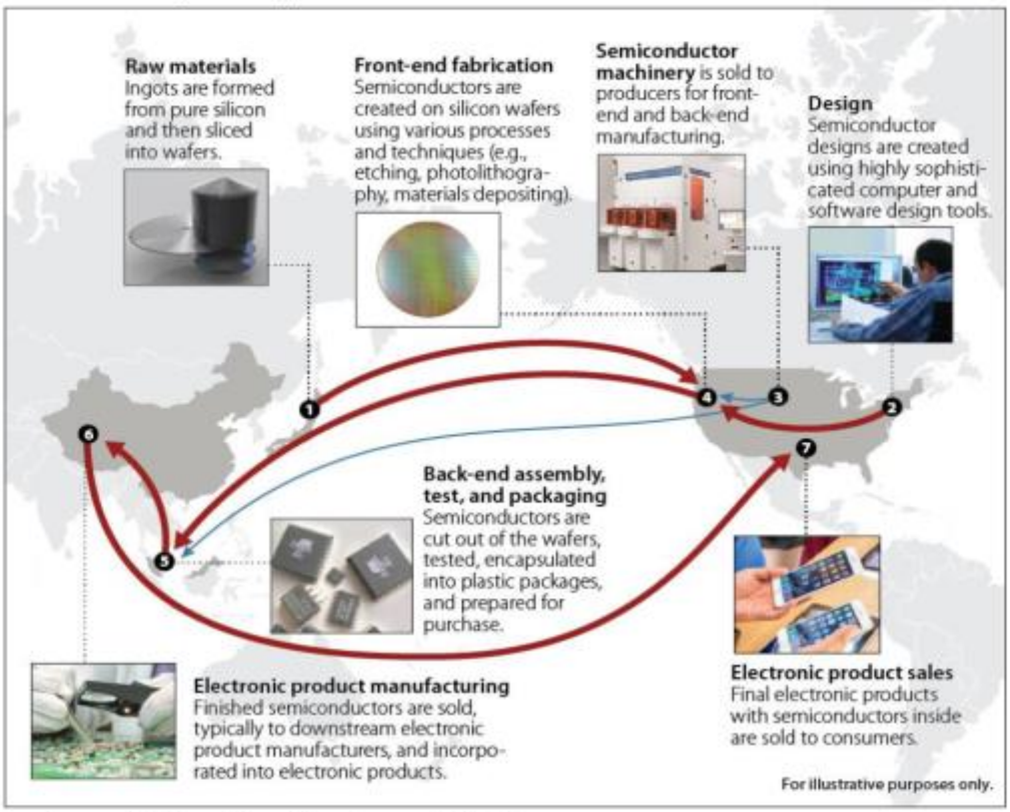
[10] Significant work has been done on global value chains in other high tech sectors to attempt to capture where the value is added within such products. Most notably, several studies, mainly by Kraemer, Linden, and Dedrick have been done to pinpoint where the value of the parts and labor of Apple products such as iPhones and iPads where created. See: https://www.usitc.gov/research_and_analysis/documents/Dedrick_USITC_3-21-12_0.pdf. In addition,

a semiconductor designed in the U.S. by a U.S. semiconductor firm likely adds an estimated 45 percent of the total value of the chip. Then, in the second stage of production, front-end fabrication, an additional estimated 45 percent of the total value is created. When this semi-finished product is exported for final ATP, roughly an estimated 90 percent of the value of the final product has already been created. This means if this product were to be imported into the United States as a final product to be sold in the U.S. market, only about 10 percent of the imported value was created in the importing country.

Table 5 below provides an illustrative example of the global nature of semiconductor fabrication and the typical locations of the production stages. Numbers 2 and 4 in the table represent the very highly value-additive process of semiconductor design and front-end fabrication where up to an estimated 90 percent of the product value is created. Number 5 indicates a typical location for ATP.

Table 5

Figure 2. Typical Global Semiconductor Production Pattern



Source: CRS, adapted from information provided by SIA.

Notes: This diagram is for illustrative purposes only. Numbered circles do not necessarily reflect where specific production, services, or sales take place.

Source: Excerpted from Congressional Research Service report 7-5700, "U.S. Semiconductor Manufacturing: Industry Trends, Global Competition, and Federal Policy," June 27, 2016 by Michaela D. Platzer and John F. Sargent, Jr.

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recognizing the importance of looking at trade from a value-added perspective given the realities of global supply chains, organizations such as the OECD have attempted to measure trade in value-added. See: http://www.oecd.org/sti/ind/49894138.pdf.

Third, U.S. semiconductor imports are often products from a U.S. semiconductor firm, not a foreign competitor – The U.S. semiconductor industry is the global market share leader, and this leadership in part can be attributed to its embrace of global value chains in its fabrication process. This means that a significant amount of U.S. semiconductor imports consists of U.S. value, not value added by foreign competitors. Since virtually all of U.S. firm ATP facilities are currently located abroad, mainly in Asia, this means a large share of U.S. semiconductor imports is from U.S.-headquartered firms with ATP facilities abroad importing semiconductor products into the U.S. market. Take, for instance, the example of U.S. bilateral semiconductor trade with Malaysia. In 2016, the United States had the largest bilateral trade deficit in semiconductors with Malaysia at over $7 billion. Yet, there is no indigenous Malaysian semiconductor industry to speak of. There are, however, a number of major U.S. semiconductor firms that have operated back-end ATP facilities in Malaysia for decades.

SIA recommends that the U.S. government look beyond the trade balance and adopt a more holistic view of the U.S. semiconductor industry. To capture more accurately all forms of semiconductor production that take place in the United States, including semiconductor design, SIA also recommends that the U.S. government implement the *Factoryless Goods Producer (FGP)* initiative which it had planned to do for the 2017 Economic Census. As mentioned earlier, under this initiative, the highly value-additive activity of semiconductor design, in which the U.S. semiconductor industry leads, would be included in government statistics, including in trade data, and provide a more accurate picture of the health of our industry.

IV. SIA Responses to Select Questions from the Federal Register Notice

SIA's comments above address several of the questions posed in the Notice. Below are additional responses to several other questions posed in the Notice.

A. Other Items Relevant for the Assessment

Have free trade agreements contributed to bilateral trade deficits and how?

SIA Response – Free trade agreements are vital to the success of the U.S. semiconductor industry as a major exporting powerhouse. Our industry relies on a complex and global supply chain for raw materials, equipment, R&D, technology, human talent, testing, and distribution. The intermediate nature of our products also requires the import and re-export of products (both in tangible and intangible forms) to meet the constantly changing needs of our customers, over 80 percent of whom are outside the United States. These factors, combined with the high-capital costs and short product-life cycles of our cutting-edge technologies, mean our industry's success and competitiveness depends on the ability to move semiconductors freely, efficiently, fairly, and quickly across borders. Free trade agreements have been critical in contributing to the semiconductor industry's trade surplus, enhancing access to large and fast-growing markets, strengthening the semiconductor supply chain, and reducing tariff and non-tariff barriers.

The Information Technology Agreement (ITA) and its expansion, for example, is considered by the World Trade Organization (WTO) and the industry to be one of the most meaningful and successful trade agreements. In the 15 years following the signing of this agreement, U.S. exports of ICT products nearly tripled to an estimated $1.4 trillion in 2010, according to the WTO. Semiconductor products make up a substantial portion of that growth, accounting for 33 percent of global exports of IT products in 2010. With semiconductor tariffs previously being as high as 30 percent in some regions, the ITA and its expansion have saved the U.S. semiconductor industry hundreds of millions of dollars annually in tariff savings.

Are there other factors related to trade deficits that the report should consider?

SIA Response – To maintain U.S. leadership in the semiconductor industry, the Administration and Congress need to work together to adopt a competitiveness and innovation agenda. Our global competitors are investing and working actively to grow their own semiconductor industry, and the U.S. needs to adopt policies that will enable U.S.-based companies to compete more effectively. We believe these policies will help contribute to making the U.S. a more competitive environment for manufacturing, innovation, and job growth and thereby contribute to growing our trade surplus.

- Creating a Pro-Competitive Tax Code – America's corporate tax code is outdated and uncompetitive, creating disincentives for making domestic investments in our highly research and capital intensive industry and placing U.S. semiconductor companies at a disadvantage compared to our foreign-based competitors. To address these concerns, SIA supports the Administration's call for pro-growth reforms to the corporate tax code. SIA supports the primary elements of both the Administration tax reform plan and the House blueprint for corporate tax reform, including (a) reducing the statutory rate to 20 percent or lower, (b) establishing a territorial system for the taxation of foreign earnings, including providing for the repatriation of past foreign earnings, and (c) preserving the research credit. These reforms would significantly improve the competitiveness of U.S. investment and manufacturing by bringing the U.S. system closer to parity with international competitor nations with a lower rate and a territorial system. Accordingly, we call on **the Administration to work with Congress to enact corporate tax reform which includes the primary elements of the House blueprint.**

- Increased Federal Investment in Basic Research – Federal investment in pre-competitive basic research has played a critical role in supporting America's technology leadership and our national security. The semiconductor industry is unique in its sustained partnership with civilian and defense research agencies over decades to invent and develop enabling technologies that help address critical national security needs, and have led to ubiquitous commercial products and systems that underpin our nation's growth and productivity. Federal investment in basic research is supplemented by the semiconductor industry's huge investment in applied R&D, amounting to over $34 billion (approximately one-fifth of revenue, among the highest of any industry). This investment depends on precompetitive university research to provide the fundamental advances. While the U.S. has long been the leader in semiconductor R&D, federal investment in this area is not keeping pace with nation-state competitors who are poised to challenge U.S. leadership in the coming years. **The United States should significantly increase its investments in research in semiconductor-related fields, conducted at American universities and national labs and in collaboration with the semiconductor industry.** Equally important to developing the innovations that solidify U.S. technology leadership in semiconductors and the many technologies that they enable, funding basic research at America's colleges, universities, and national labs plays a critical role in supporting the "pipeline" of talent for the next generation of semiconductor innovators, thereby strengthening America's technology workforce.

- Strengthening America's Semiconductor Workforce – The success of the U.S. semiconductor industry is due to the talent and skills of our workforce. America's technology leadership is dependent on our country's ability to develop and attract the best technologists and engineers in the world. SIA calls on the Administration to take action to ensure the U.S. workforce remains the best in the world, including **(a) incentivizing qualified STEM graduates to work in the U.S. semiconductor industry by, for example, forgiving tuition loans for such graduates, (b) increasing long-term funding for STEM education in primary and secondary schools as a means of building the American technology workforce of the future, and (c) enacting immigration reforms that expand the number of "green cards" for STEM graduates educated at U.S. colleges and universities**, thereby enabling the semiconductor industry to attract and retain the best and brightest from around the world.

B. Practices of Trading Partners [that] have Affected Opportunities for Increased U.S. Exports, Profitability, and Employment

SIA Response – Because over 80 percent of sales of U.S. semiconductor companies are to customers outside the United States, access to global markets and a level playing field are critical to sustain semiconductor technology innovation. The industry relies on a complex and globally integrated supply chain and access to customers around the world. Maintaining the flow of people, goods, and materials throughout this value chain is essential to the industry's continued success. The U.S. government can facilitate our success by ensuring our trading partners provide fair access to markets in compliance with global trade rules and norms. In particular, the Administration should actively monitor the semiconductor policies of our trading partners, including especially China's semiconductor subsidy programs, secure and controllable policies, and any protectionist trade policies by our trading partners that hinder the healthy growth of the global semiconductor industry, to ensure consistency with all international and bilateral trade commitments. The U.S. should also lead in working with our trading partners to eliminate tariffs and non-tariff barriers to trade by expanding and developing new trade agreements. These agreements should cover areas such as imposition of barriers to products with commercial encryption, disciplines on government subsidies and industrial policy, and other areas of critical importance.

Conclusion

SIA appreciates the opportunity to provide input regarding executive order 13786 on Significant Trade Deficits, and we look forward to working with the Administration on trade and innovation policies that will advance the competitiveness of the U.S. semiconductor industry.

Respectfully submitted,

John Neuffer
President and CEO
Semiconductor Industry Association

Annex 1

2016 U.S. Semiconductor Trade Balance Data for the 13 Countries Mentioned in the Federal Register Notice

Exhibit 1

Country	U.S. Semiconductor Exports (US$)	U.S. Semiconductor Imports (US$)	U.S. Trade Balance (US$)
Canada	1,796,058,208	782,005,709	1,014,052,499
China	5,836,941,243	3,325,514,795	2,511,426,448
EU 28	2,313,595,078	4,043,048,942	-1,729,453,864
India	119,013,890	33,099,673	85,914,217
Indonesia	13,926,167	84,590,569	-70,664,402
Japan	991,684,874	1,965,088,677	-973,403,803
South Korea	2,843,823,609	1,891,172,598	952,651,011
Malaysia	4,548,955,118	12,024,686,148	-7,475,731,030
Mexico	7,405,203,761	635,989,548	6,769,214,213
Switzerland	34,832,680	80,179,991	-45,347,311
Taiwan	3,712,776,478	3,758,827,845	-46,051,367
Thailand	1,533,375,891	875,997,650	657,378,241
Vietnam	1,734,781,837	2,248,444,471	-513,662,634
Sub-total – 13 countries	32,884,968,834	31,748,646,616	1,136,322,218
Total – All Countries	41,270,463,640	34,874,311,100	6,396,152,540

Source: Official U.S. government trade data, U.S. Department of Commerce, obtained from the U.S. International Trade Commission, Dataweb: https://dataweb.usitc.gov/. U.S. semiconductor export, import and trade balance data is defined as all the HTS subheadings that concord with NAICS code 334413 except for the following five subheadings: 3818000010, 3818000090, 8541402000, 8541406020, 8541406030. For the description of these five subheadings and the complete list of all subheadings included in the semiconductor trade data, please see Annex 2, Exhibit 1 and 2.

Annex 2

Below in Exhibits 2 and 3 are the detailed lists of all U.S. harmonized tariff schedule (HTS) import and export subheadings at the 8 and 10-digit level that concord with the North American Industry Classification System (NAICS) code 334413, "Semiconductor and Related Device Manufacturing."

Of these HTS subheadings, the following five in Exhibit 1 represent provisions for products that are not considered to be part of the semiconductor industry:

Exhibit 1

HTS Subheading Number	**HTS Product Description**	**Comment**
3818000010	Chemical elements doped for use in electronics, in the form of discs, wafers or similar forms; chemical compounds doped for use in electronics; gallium arsenide wafers, doped	These products are raw materials for semiconductor manufacturing, they are not semiconductors.
3818000090	Chemical elements doped for use in electronics, in the form of discs, wafers or similar forms; chemical compounds doped for use in electronics; other chemical elements doped for use in electronics, in the form of discs, wafers of similar forms; chemical compounds doped for use in electronics	These products are raw materials for semiconductor manufacturing, they are not semiconductors.
8541402000	Light-emitting diodes (LED'S)	These products have a different end use and customer base from semiconductors
8541406020	Solar cells assembled into modules or made up into panels	These products are not produced by semiconductor firms, not considered semiconductor products by either the semiconductor or solar industries and have a different end use and customer base from semiconductors. NOTE: Of the five categories listed in this table, the vast majority of the value of U.S. imports (over $8 billion in 2016) occurred for products provided for in this subheading.
8541406030	Solar cells, not assembled into models or make up into panels	These products are not produced by semiconductor firms, not considered semiconductor products by either the semiconductor or solar industries and have a different end use and customer base from semiconductors
Source: Official U.S. government trade data, U.S. Department of Commerce, obtained from the U.S. International Trade Commission, Dataweb: https://dataweb.usitc.gov/.		

Therefore, any trade balance analysis of semiconductors should exclude trade in products provided for under these subheadings. In Exhibit 2 and 3 below, the subheadings to be excluded have been highlighted in red and crossed out.

Exhibit 2

HTS item number entered: **334413**	
Classification type: **NAICS**	
Import or export commodity number: **Import number**	
Corresponding 8-digit and 10-digit HTS item numbers:	
import_hts8	**import_hts10**
85422180	8542218021
85421380	8542138012
85421380	8542138038
85422180	8542218039
85423200	8542320032
85421380	8542138005
85423200	8542320060
85422180	8542218024
85422180	8542218059
85422180	8542218082
85422900	8542290040
85235200	8523520090
85421380	8542138045
85423900	8542390000
85421380	8542138029
85235200	8523520010
85423900	8542390001
85421380	8542138039

85421380	8542138065
85421480	8542148001
85422180	8542218071
85421980	8542198079
85422900	8542290010
85422180	8542218060
85423000	8542300040
85415000	8541500080
85421380	8542138058
85412900	8541290075
85423200	8542320028
85421380	8542138052
85423200	8542320020
85421380	8542138051
~~38180000~~	~~3818000090~~
85422180	8542218028
85422900	8542290050
85411000	8541100040
85421480	8542148092
85423200	8542320051
85421980	8542198073
85422180	8542218091
85421480	8542148017
85422180	8542218025
85421380	8542138043
~~85414020~~	~~8541402000~~

85414095	8541409500
85412900	8541290095
85422180	8542218089
85423200	8542320021
85423200	8542320002
85414060	8541406050
85422180	8542218042
85421480	8542148004
85421980	8542198096
85426000	8542600075
85421980	8542198001
85423200	8542320024
85413000	8541300080
85421380	8542138057
85421380	8542138059
85421380	8542138030
85422180	8542218027
85414060	8541406010
85421980	8542198078
85423300	8542330000
85413000	8541300040
85423100	8542310000
85423000	8542300065
85414070	8541407080
85421380	8542138010
85421380	8542138067

85412100	8541210040
85421380	8542138021
85421380	8542138022
~~85414060~~	~~8541406020~~
85412900	8541290040
85423200	8542320070
85423100	8542310001
85421380	8542138041
85424000	8542400075
85426000	8542600095
85423200	8542320022
85422900	8542290030
85421380	8542138023
85414080	8541408000
85423200	8542320041
85421380	8542138024
85421440	8542144000
85423200	8542320023
85423200	8542320036
85423300	8542330001
85421380	8542138072
85422180	8542218030
85421480	8542148007
85422180	8542218081
85421380	8542138096
85422180	8542218029

85422180	8542218051
~~38180000~~	~~3818000010~~
85422180	8542218041
85421480	8542148011
85411000	8541100050
85421380	8542138026
85422180	8542218026
85421380	8542138066
85421380	8542138092
85422180	8542218020
85421380	8542138068
85421980	8542198092
85414070	8541407040
85421380	8542138037
85421480	8542148012
85423000	8542300060
85423000	8542300080
85411000	8541100060
85423200	8542320001
85421480	8542148096
85422180	8542218031
85421380	8542138049
85422180	8542218049
85421980	8542198002
85411000	8541100070
85421380	8542138032

85421380	8542138034
85412100	8541210075
85422180	8542218032
85422180	8542218023
85422180	8542218072
85421380	8542138060
85422180	8542218022
85423200	8542320061
85421200	8542120000
85423200	8542320040
85423200	8542320071
85415000	8541500040
85421480	8542148002
85422180	8542218052
85422140	8542214000
85424000	8542400095
85412100	8541210095
85421940	8542194000
85422180	8542218010
85422180	8542218099
85429000	8542900000
~~85414060~~	~~8541406030~~
85421340	8542134000
85421380	8542138031
85422900	8542290020
85411000	8541100080

85422180	8542218079
85423000	8542300090
85419000	8541900000
85421000	8542100000
85422180	8542218005
85423200	8542320050

Exhibit 3

HTS item number entered: **334413**	
Classification type: **NAICS**	
Import or export commodity number: **Export number**	
Corresponding 8-digit and 10-digit HTS item numbers:	
export_hts8	**export_hts10**
85412100	8541210040
85422180	8542218021
~~85414060~~	~~8541406020~~
85412900	8541290040
85423200	8542320070
85421380	8542138025
85421380	8542138012
85424000	8542400075
85426000	8542600095
85421380	8542138056
85421380	8542138005
85422900	8542290030
85423200	8542320060
85422900	8542290040

85235200	8523520090
85414080	8541408000
85422180	8542218058
85421440	8542144000
85423900	8542390000
85423200	8542320023
85235200	8523520010
85421380	8542138065
85421480	8542148001
85422180	8542218071
85421380	8542138072
85421980	8542198079
85422900	8542290010
85422180	8542218060
85423000	8542300040
85421380	8542138028
85415000	8541500080
85421480	8542148007
85421380	8542138096
85421480	8542148011
85411000	8541100050
85421380	8542138066
85422180	8542218088
85421380	8542138027
85421380	8542138092
85422180	8542218028

85422900	8542290050
85411000	8541100040
85421480	8542148092
85421380	8542138068
85421980	8542198092
85414070	8541407040
85421480	8542148012
85421980	8542198073
85423000	8542300060
85421380	8542138044
85422180	8542218091
85423000	8542300080
85411000	8541100060
85423200	8542320015
85421480	8542148096
85421480	8542148017
85422180	8542218031
85421380	8542138043
~~85414020~~	~~8541402000~~
85414095	8541409500
85412100	8541210080
85421980	8542198002
85411000	8541100070
85421380	8542138061
85422180	8542218072
85414060	8541406050

~~38180000~~	~~3818000000~~
85235200	8523520000
85421480	8542148004
85421980	8542198096
85422180	8542218048
85426000	8542600075
85421200	8542120000
85421980	8542198001
85423200	8542320024
85413000	8541300080
85423200	8542320040
85422180	8542218038
85414060	8541406010
85421980	8542198078
85423300	8542330000
85415000	8541500040
85413000	8541300040
85421480	8542148002
85412900	8541290080
85422140	8542214000
85423100	8542310000
85424000	8542400095
85421940	8542194000
85422180	8542218010
85422180	8542218099
85429000	8542900000

~~85414060~~	~~8541406030~~
85421340	8542134000
85422900	8542290020
85423000	8542300065
85411000	8541100080
85414070	8541407080
85422180	8542218079
85423000	8542300090
85419000	8541900000
85421000	8542100000
85422180	8542218005
85421380	8542138010
85423200	8542320050
85421380	8542138067

Source for Exhibits 3 and 4: Developed by the U.S. International Trade Commission (USITC) from material supplied by the U.S. Department of Commerce. Accessed using the USITC's Commodity Translation Wizard at: https://dataweb.usitc.gov/scripts/commod_select.asp.