

# ***Multilateralizing Export Controls: The Semiconductors Case Study***

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# US Export Controls on Semiconductors:

## Originally to address **Huawei** and then **SMIC**



Date	Event
January 28, 2019	<a href="#">Department of Justice</a> indictment of Huawei
May 15, 2019	<a href="#">Department of Commerce</a> announces addition of Huawei Technologies Co. Ltd. to the Entity List
August 19, 2019	<a href="#">Department of Commerce</a> adds dozens of new Huawei affiliates to the Entity List
May 15, 2020	<a href="#">Department of Commerce</a> implements foreign direct product rule (FDPR) to restrict access by Huawei and its affiliates (e.g., HiSilicon) on the Entity List to U.S.-origin software-based design tools and equipment
June 15, 2020	<a href="#">Department of Commerce</a> issues new rule so that technology that would not have required a license to be disclosed to Huawei before the company's placement on the Entity List can be disclosed for the purpose of standards development in a standards-development body without need for an export license.
July 2020	Senate and House pass National Defense Authorization Act (NDAA) including amendments granting federal support for the US semiconductor industry
August 17, 2020	<a href="#">Department of Commerce</a> makes additional adjustments to export control regulations via FDPR designed to further restrict Huawei from obtaining foreign made chips developed or produced from U.S. software or technology to the same degree as comparable U.S. chips.
December 18, 2020	<a href="#">Department of Commerce</a> adds SMIC to the Entity List

# The Modern, Global Semiconductor Industry



Figure 5

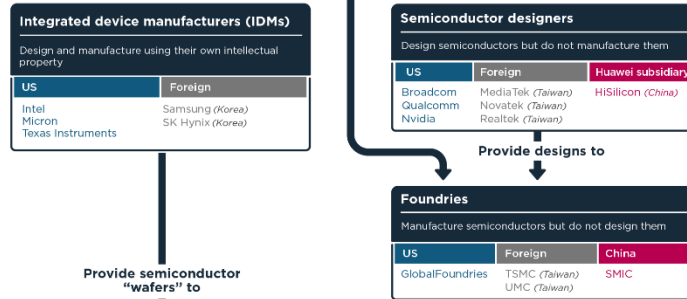
## Modern semiconductor manufacturing is a globally integrated, multi-stage process

The stages and examples of companies involved in the semiconductor design and manufacturing supply chain

### Inputs



### Design and manufacture



### Assemble, test, and package



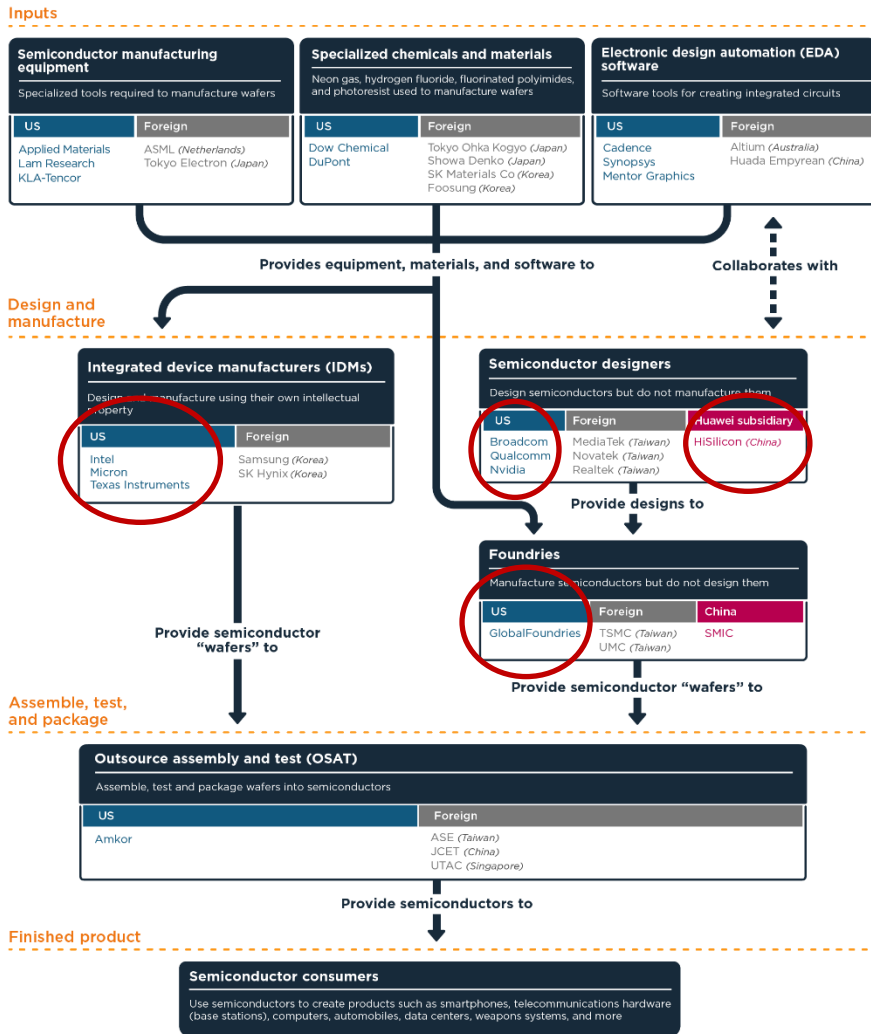
### Finished product





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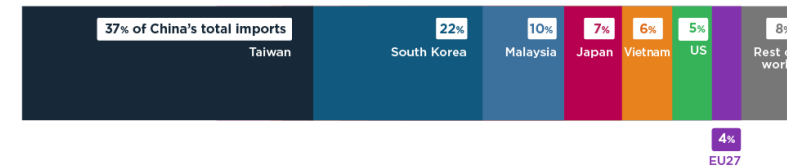
PIIE Note: Examples of companies are illustrative.  
 Source: Constructed by the author.

## Step 1: 2019 US export controls...

- Choke point? Chips
- No! Too narrow for national security
  - Supply chains – did not cut off Huawei's access to 5G chips (Taiwan, South Korea)
- Question: Why not multilateralize here?

Figure 4  
**Taiwan and South Korea are China's top foreign suppliers of semiconductors**

China's semiconductor imports by foreign source in 2020 (through August)



PIIE Note: Semiconductors are defined as Harmonized System Codes 8541 and 8542. Total may not sum to 100 due to rounding.  
 Sources: Constructed by the author from Chinese import data from Chinese customs for 2020.

- Too broad economically?  
 (is the goal 5G? or is it Huawei?)

Figure 5

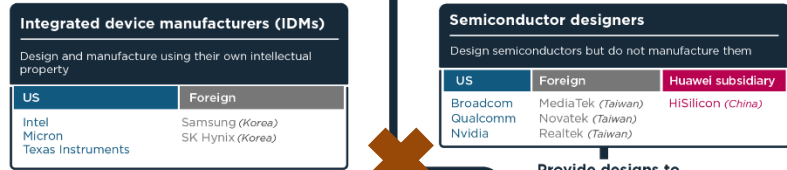
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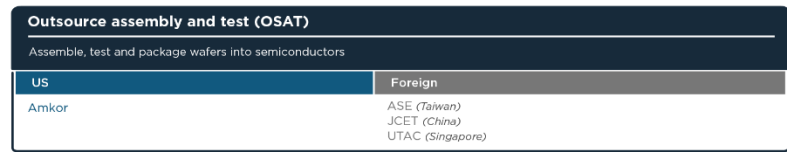
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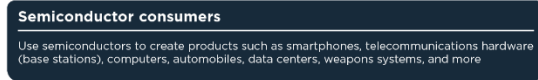
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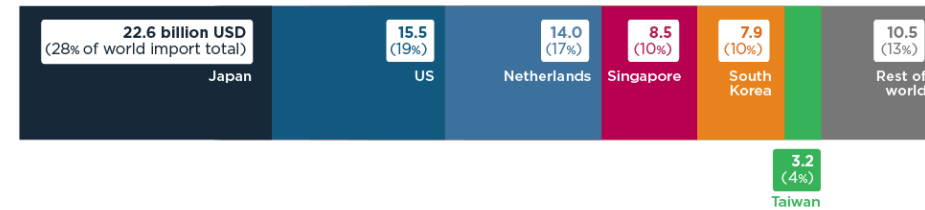
## Step 2: 2020 export controls...

- Another choke point? Where else do American firms have dominance in the global industry?
  - Equipment?!?

Figure 5

### American companies face stiff global competition in semiconductor manufacturing equipment

World trade in semiconductor manufacturing equipment by exporter, 2019

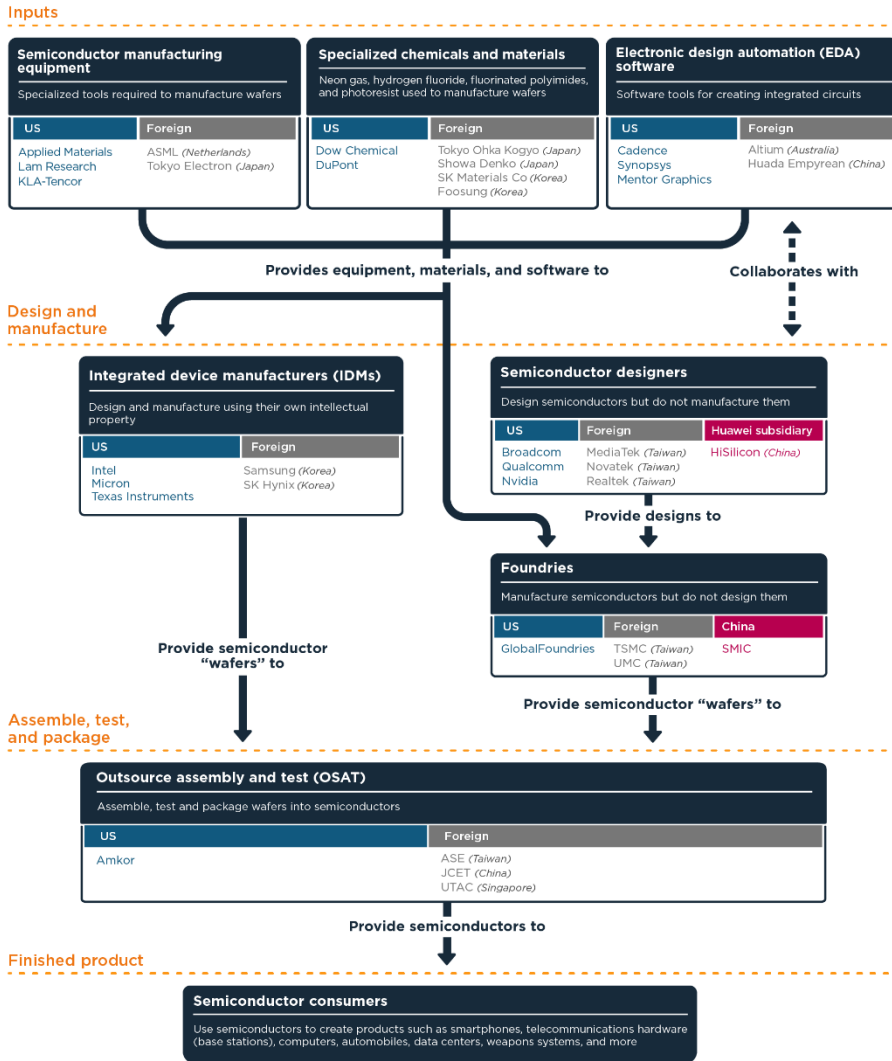


Note: Semiconductor manufacturing equipment is defined as Harmonized System Code 8486.

Sources: Constructed by the author with world trade data from International Trade Centre (Trademap) for 2019.

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## Why multilateralize export controls?



- More likely to work at mitigating security threat
- I.e., will rarely get lucky and have an equipment choke point
- Equipment was *extra-territorial* (political sustainability)

## How to multilateralize export controls?

### Problem:

- Waasenaar Arrangement ill-suited institutionally
- COCOM model has lessons

### Operationalizing issues:

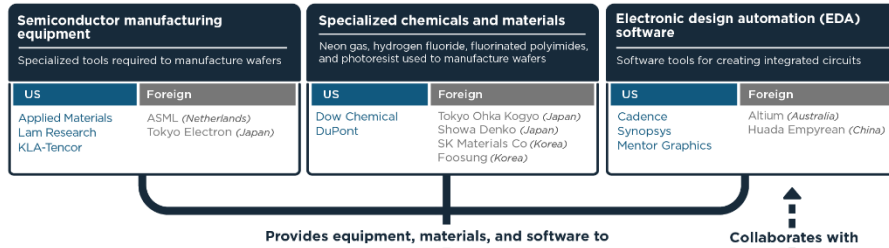
- Partners defined by sectoral interests?
- Problem: will be tradeoffs. I.e., country x may lose commercially in AI but gain commercially in semiconductors

Figure 5

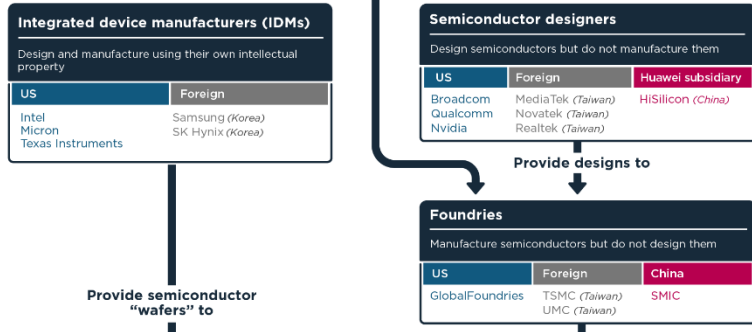
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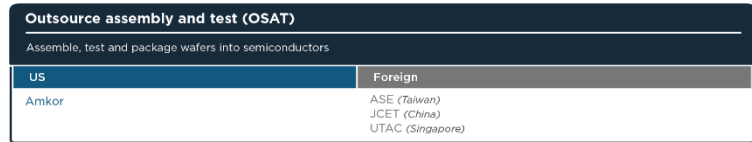
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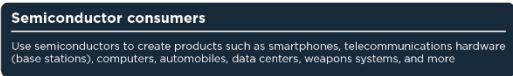
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# Implications



## Other (unintended) consequences

- Foreign fabs “design out” American tools and software
  - Economic consequences
  - Policy consequences
- Where to locate “activity” – new concern for doing so in the US
- Huawei or 5G? Huawei’s smartphone, other Chinese smartphones move away from US chips, lost revenue for industry

## Policy

- Foreign governments concerned about lack of policy coordination (*extra-territorial* actions on TSMC and Samsung)
- Identifies institutional (multilateral, Wassenaar Arrangement) weaknesses for export controls
- China doubles down on industrial policy, IP theft, further develops in its unreliable entities list
- US subsidizes semiconductors (NDAA)

## On 5G and critical infrastructure: Is there another way?

- Procurement decisions
- Subsidizing other suppliers
- Open-Ran

# Semiconductors At The Heart And Periphery Of The US-China Trade War



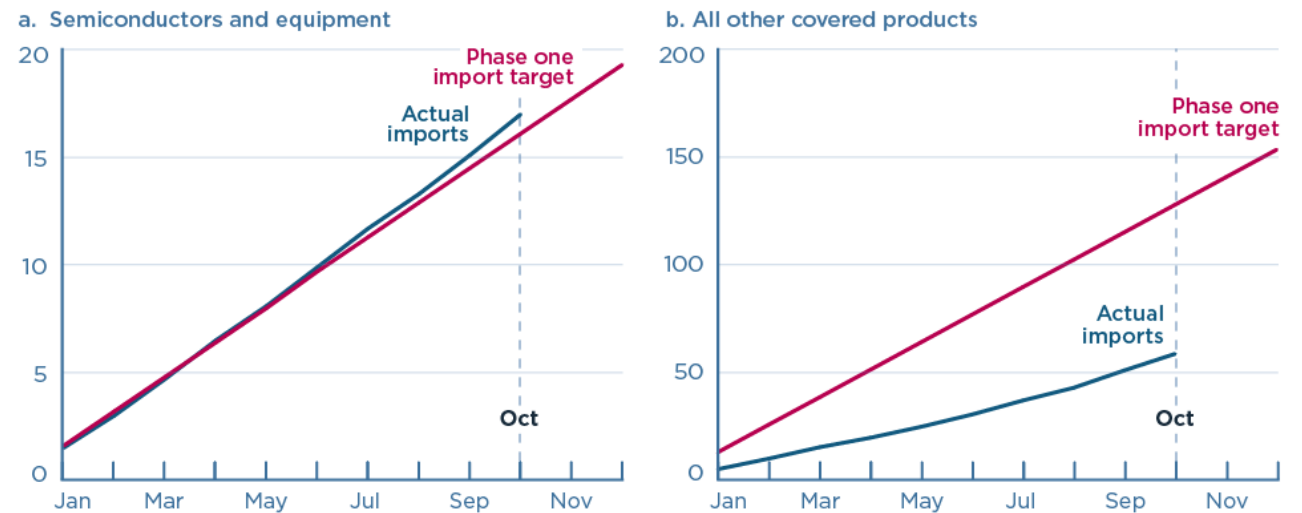
## Section 301 and unfair trade concerns

- US tariffs, China's tariffs
- Changing political economy
- **Phase One agreement**

Figure 6

### China's 2020 purchases of semiconductors and equipment outperformed other goods covered in the phase one agreement

China's imports covered by the phase one agreement by product, billions USD (through October 2020)



**Note:** Constructing an estimated target for the semiconductor industry (Harmonized System Codes 8541, 8542, and 8486) and prorating the 2020 year-end target to a monthly basis is for illustrative purposes only. Nothing in the text of the agreement indicates China must meet anything other than the year-end targets. Estimated targets in panel a and b apportioned based on the share of each in total US exports to China in 2017 of goods covered by the purchase commitments.

**Sources:** Constructed by the author from Chinese import data from International Trade Centre (Trademap) for 2017 and Chinese customs for 2020, and product categories set out in Annex 6.1 of Economic and Trade Agreement between the United States of America and People's Republic of China. See also Chad P. Bown. 2020. US-China phase one tracker: China's purchases of US goods (as of October 2020). PIIE Chart, November 25.





# References

- Bown, Chad P., "[How the United States marched the semiconductor industry into its trade war with China,](#)" *East Asian Economic Review* v24, n4 (December 2020): 349-388.
- Bown, Chad P., "[Export Controls: America's Other National Security Threat,](#)" *Duke Journal of Comparative and International Law* v30, n2 (Spring 2020): 283-308.