BUREAU OF INDUSTRY AND SECURITY

UPDATE CONFERENCE ON EXPORT CONTROLS AND POLICY

MARCH 18-20, 2025

Measuring Effectiveness and the Evidence Act

Kevin M. Coyne
Director
Office of Technology Evaluation

Session Agenda

I. BIS Mission

II. Overview of the Evidence Act

III. Framework for Measuring Effectiveness

I. Evaluation Processes
II. Data Sources and Tools
III. Examples of Evidence

IV. Panel Q&A

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MARCH 18-20, 2025

BIS Mission & The Evidence Act

BIS Mission Statement

Advance **U.S. national security**, **foreign policy**, and **economic objectives** by ensuring an effective export control and treaty compliance system and promoting continued U.S. strategic technology leadership.

Overview of the Evidence Act

Evidence Act

The **Foundations for Evidence-based Policymaking Act of 2018** (the Evidence Act) was established **to advance evidence-building** in the federal government by improving access to data and expanding evaluation capacity.

Requirements

1. A list of policy-relevant **questions**
2. A list of **data** the agency intends to collect, use, or acquire
3. A list of **methods** and analytical approaches
4. A list of any **challenges** to developing evidence to support policymaking

Compliance with the Evidence Act

In adhering to the Foundations for the Evidence-based Policymaking Act of 2018, BIS has developed an **evaluative framework to assess and measure the effectiveness** and projected impact **of U.S. export controls**, while formalizing the process of evidence collection and analysis, to advance **U.S. national security**, **foreign policy**, and **economic objectives**. This **repeatable framework** will enable BIS to address existing gaps and enhance the overall effectiveness of export controls.

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MARCH 18-20, 2025

Framework for Measuring Effectiveness

Evaluative Framework Overview

Regime Type

Understand the different ways that the USG can develop and implement export controls:

- **Unilateral**
- **Multilateral**
- **Plurilateral**

Policy Objective

Identify the policy objective of a specific export control that is under review:

- **Limiting Access**
- **Promoting Access**

Review Stage

Determine the stage at which the export control review is being conducted:

- **Pre-Implementation**
- **Post-Implementation**

Control Assessment

Conduct export control assessments by developing questions to guide the process:

- **Identify Data**
- **Collect Data**
- **Analyze Data**

Policy Implication

Identify the appropriate next steps based on the conclusions drawn from the assessments:

- **Implementation**
- **Revision**
- **No Adjustments**

Notable Data Sources and Tools

Government	Internal BIS Data (e.g., Licensing Statistics, Enforcement Statistics), USG Shipment Records (e.g., Automated Export System, Commerce USXPORTS Exporter Support System (CUESS), Interagency Discussions, Multilateral Governmental Discussions
Industry	Industry Engagement, BIS Technical Advisory Committees, and Defense Production Act Surveys
Commercially Available	Trade Databases, Market Research Reports, and Technical Reports
Open-Source	Company Resources, Import & Export Statistics by Country, Think Tank Reports, and News Articles

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MARCH 18-20, 2025

Pre-Implementation Overview

Review Stage: Pre-Implementation

1 Technology Analysis

- **Technology:** Identification of Technology, Technical Specifications, Commercialization Rate, Current Applications
- **Suppliers:** Value Chain, Supply Chain, Market Share
- **Alternatives:** Alternative Technologies, Foreign Availability

2 Projected Impact Assessment

- **National Security Impact:** Adversary Market Share, Supply Chain, Production, Indigenization (R&D), Investments
- **Economic Impact:** U.S. & Allies Market Share, Innovation & Leadership, Investments & Partnerships

3 Administration & Enforcement

- **Export Administration:** Adequate Terminologies, Review Cycle
- **Export Enforcement:** Enforcement Complexities, International Support, Potential Evasion Tactics

Review Stage: Pre-Implementation

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2 Projected Impact Assessment

3 Administration & Enforcement

- Identification of Technology
  - *Is this the appropriate technology to control for national security objectives?*
- Analysis of Technical Specifications
  - *What are the technical specifications for a given application?*
- Analysis of Commercialization Rate
  - *How widely adopted is this technology?*
- Analysis of Current Applications
  - *Which industries are currently utilizing this technology?*

Identification of Technology

CRITICAL AND EMERGING TECHNOLOGIES LIST UPDATE

Critical and Emerging Technologies List

The following critical and emerging technology areas are of particular importance to the national security of the United States:

- Advanced Computing
- Advanced Engineering Materials
- Advanced Gas Turbine Engine Technologies
- Advanced and Networked Sensing and Signature Management
- Advanced Manufacturing
- Artificial Intelligence
- Biotechnologies
- Clean Energy Generation and Storage
- Data Privacy, Data Security, and Cybersecurity Technologies
- Directed Energy
- Highly Automated, Autonomous, and Uncrewed Systems (UxS), and Robotics
- Human-Machine Interfaces
- Hypersonics
- Integrated Communication and Networking Technologies
- Positioning, Navigation, and Timing (PNT) Technologies
- Quantum Information and Enabling Technologies
- Semiconductors and Microelectronics
- Space Technologies and Systems

- BIS reviews the strategic importance and national security implications of critical and emerging technologies to assess the reasons for export controls
- BIS consults with interagency stakeholders, industry experts, and authoritative policy documents, such as OSTP Critical and Emerging Technologies (CET) list to understand the national security implications before implementing export controls

Review Stage: Pre-Implementation

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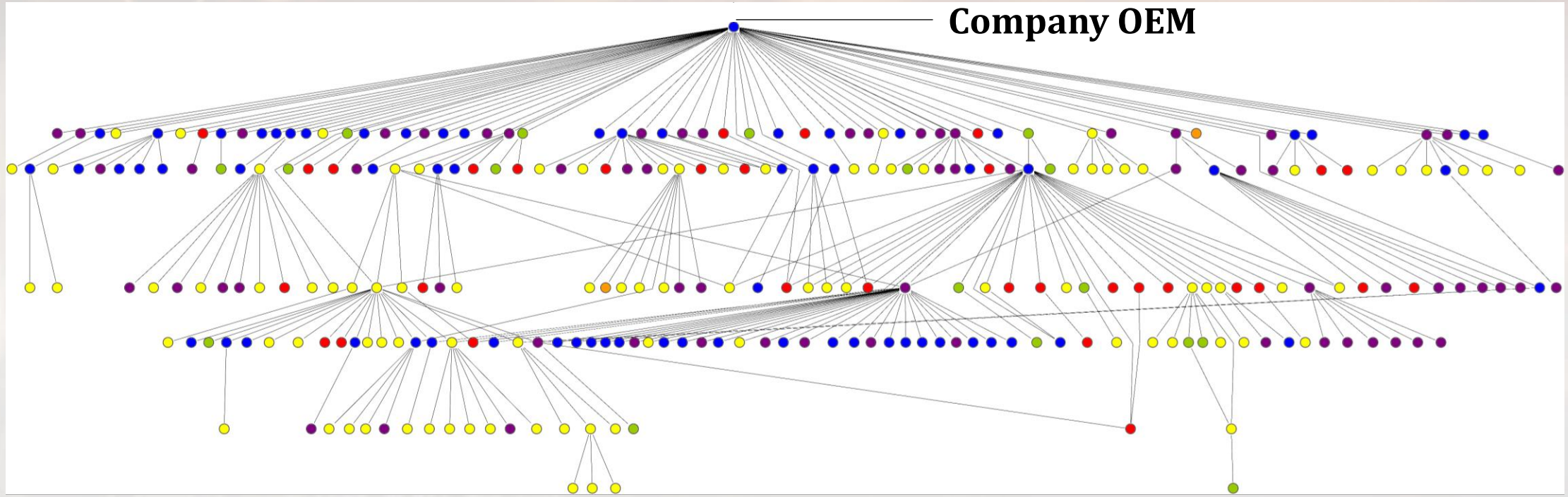
2 Projected Impact Assessment

- Analysis of Value Chain
  - *What are the key components of this product?*
- Analysis of Supply Chain
  - *Who produces these key components?*
- Analysis of Market Share
  - *Who are the leaders in global market share?*

3 Administration & Enforcement

Supply Chain Analysis



Review Stage: Pre-Implementation

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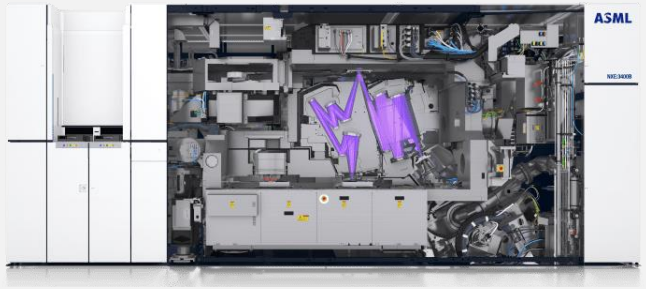
2 Projected Impact Assessment

3 Administration & Enforcement

- Analysis of Alternative Technologies
  - *Can an alternative technology perform a similar function?*
- Analysis of Foreign Availability
  - *Can a non-U.S. supplier produce this technology?*

Foreign Availability

ASML (Netherlands)



Nikon (Japan)

SMEE (China)

BIS evaluates the technological capabilities of products manufactured by non-U.S. suppliers. To enhance the effectiveness of U.S. export controls on lithography equipment, the Netherlands and Japan have aligned their export controls with those of the U.S. to restrict the sale of certain lithography equipment to China.

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UPDATE CONFERENCE ON EXPORT CONTROLS AND POLICY

MARCH 18-20, 2025

Post-Implementation Overview

Review Stage: Post-Implementation

1 Effectiveness Assessment

- **Trade:** Legal Trade, Transshipment (3rd Party Countries), Illicit Trade
- **Manufacturing:** Adversary Production, Supply Chain, Technology Advancement
- **Alternatives:** Alternative Technologies and Suppliers

2 Impact Assessment

- **National Security Impact:** Adversary Market Share, Indigenization (R&D), Investments
- **Economic Impact:** U.S. & Allies Market Share, Innovation & Leadership, Investments & Partnerships

3 Administration & Enforcement

- **Export Administration:** Adequate Terminologies, Adequate Time, License Application Trends
- **Export Enforcement:** Enforcement Complexities, International Support

Review Stage: Post-Implementation

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  - *Did it terminate legal trade with restricted countries?*
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- Effect on Illicit Trade
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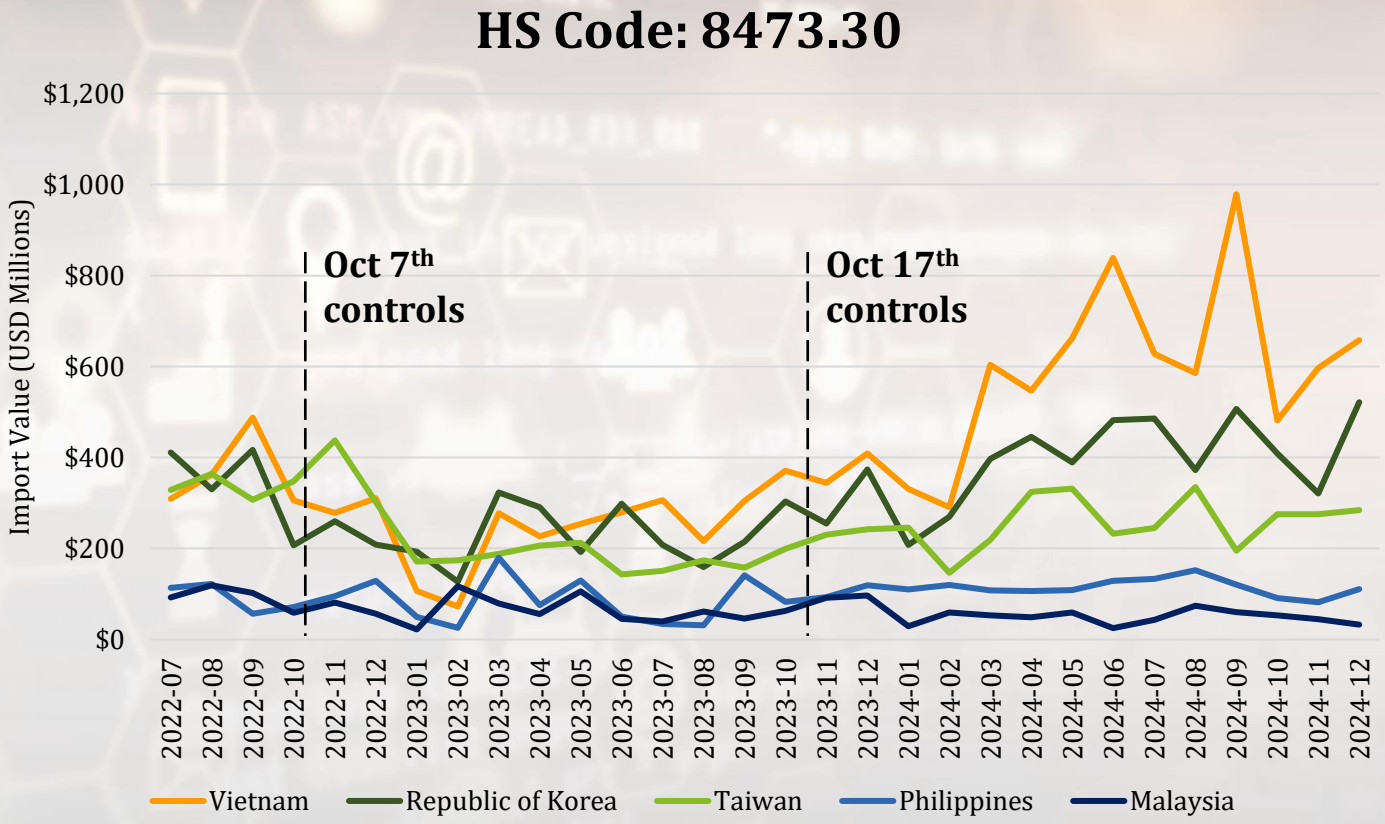
3 Administration & Enforcement

Trade Data: Chinese Imports of GPUs

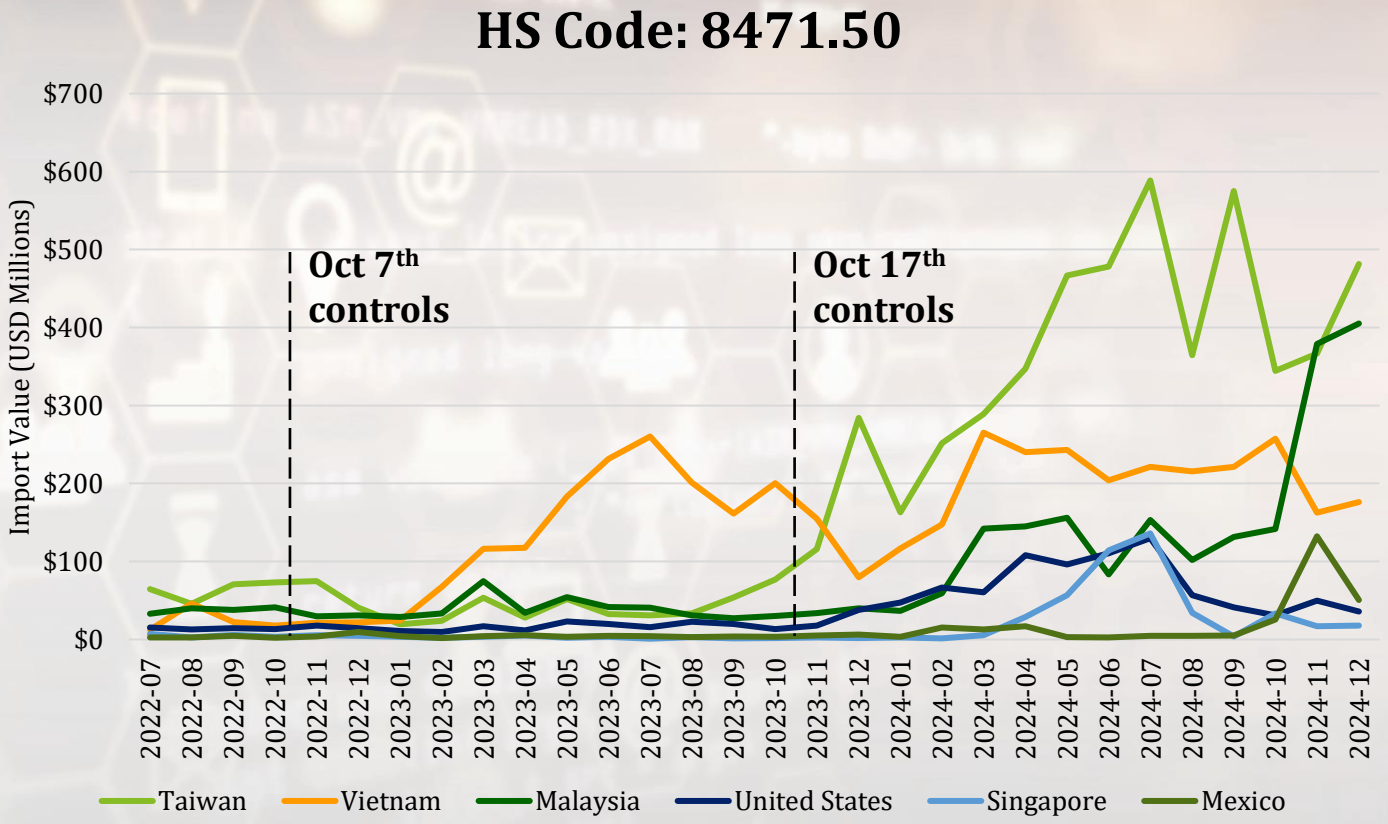


Note: *HS Code 8473.30 includes parts and accessories of automatic data processing machines and units thereof*

Since the announcement of the October 17th controls, China's imports from **Vietnam** for HS code 8473.30, which includes GPUs, have spiked **91.4%**, from **$334M** in **November 2023** to **$658M** in **December 2024**.

Over the past year, notable **Original Design Manufacturers (ODMs)** have increased **GPU manufacturing capacity** in Vietnam, Taiwan, Malaysia, and Thailand.

Trade Data: Chinese Imports of GPU Servers



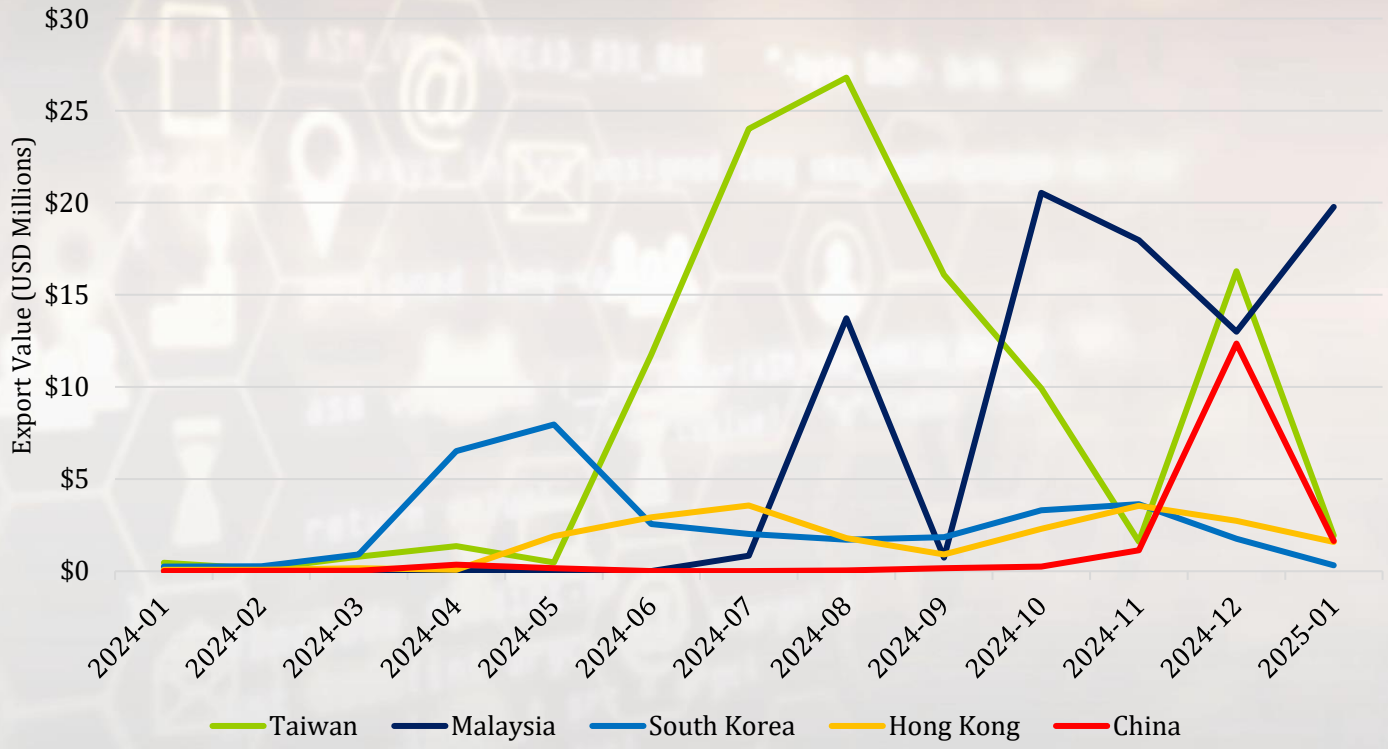
Since the announcement of the October 17th controls, China's imports from Malaysia for HS code 8471.50, which includes GPU servers, have spiked **1,105.4%**, from **$33.6M** in **November 2023** to **$405M** in **December 2024**.

Open-source reports indicate that Chinese entities have been acquiring **controlled GPUs** through 3rd party intermediaries in **Taiwan**, **Vietnam**, **Malaysia,** and **Singapore.**

Note: *HS Code 8471.50 includes processing units*

Trade Data: U.S. Exports of GPUs

HS Code: 8542.31.00.40



In January 2024, a new 10-digit HS code was created to track imports and exports of GPUs.

Since July 2024, U.S. exports of GPUs to **Malaysia** have spiked **2,270%**, from **$834.5K** in July 2024 to **$19.7M** in January 2025.

Open-source reports suggest that Chinese entities have acquired **controlled GPUs** by routing them through Malaysia.

Note: *HS Code 8542.31.00.40 includes Graphic Processing Units (GPUs)*

Transshipment: Advanced GPUs

- "Chinese resellers…said they used entities **registered outside of China** to purchase Nvidia servers from companies in places such as **Malaysia**, **Vietnam** and **Taiwan**. These companies, which include data-center operators and authorized Nvidia customers, buy the servers for their own use and **resell a portion to China**, they said."
- "**Organized AI chip smuggling** to China has been tracked out of countries including **Malaysia**, **Singapore** and the **United Arab Emirates**, the source said."
- Singapore's Home Affairs and Law Minister said the servers used in the fraud case may have contained Nvidia's advanced chips and were supplied by Dell Technologies and Super Micro Computer to Singapore-based companies before they were sent to Malaysia. **"Whether Malaysia was the final destination … we do not know for certain at this point."**

Source: *Reuters and WSJ*

Review Stage: Post-Implementation

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2 Impact Assessment

- **National Security Impact:** Adversary Market Share, Indigenization (R&D), Investments
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3 Administration & Enforcement

- Impact on U.S. Market Share
  - *By how much did it change?*
- Impact on U.S. Innovation & Leadership
  - *How did it affect U.S. technological competitiveness?*
- Impact on U.S. Investments & Partnerships
  - *What financial changes occurred after the action?*

EAR Update on AUKUS

In September 2021, leaders of Australia, the United Kingdom, and the United States announced the creation of an **enhanced trilateral security partnership** called **"AUKUS"** to strengthen the ability of each government to support security and defense interests, building on longstanding and ongoing bilateral ties.

Export Control Revisions for Australia, United Kingdom, United States (AUKUS) Enhanced Trilateral Security Partnership
IFR (89 FR 28594) - 04/19/24

Export Administration Regulations: Removal of License Requirements for Certain Spacecraft and Related Items for Australia, Canada, and the United Kingdom
R (89 FR 84766) - 10/23/24

Commerce Country Chart Update

To promote the AUKUS partnership, BIS removed license requirements for NS1, RS1, and MT1 reasons for control for the destinations of **Australia and the UK**.

Countries	Chemical and biological weapons			Nuclear nonproliferation		National security		Missile tech	Regional stability		Firearms convention	Crime control			Anti-terrorism	
	CB 1	CB 2	CB 3	NP 1	NP 2	NS 1	NS 2	MT 1	RS 1	RS 2	FC 1	CC 1	CC 2	CC 3	AT 1	AT 2
Australia	X												X			
China	X	X	X	X	X	X	X	X	X	X		X	X	X		
France [3]	X					X		X	X				X			
Germany [3]	X					X		X	X				X			
Israel	X	X	X	X	X	X	X	X	X	X		X	X	X		
Italy [3]	X					X		X	X				X			
Japan [3]	X					X		X	X				X			
Korea, South [3 4]	X					X		X	X				X			
Russia [6]	X	X	X	X	X	X	X	X	X	X		X	X			
United Kingdom	X												X			

Notable Commercial Partnerships - MT

JUN 2024

Entities: BryceTech, JVAT, L3Harris, Teledyne Reynolds, Raytheon, Amentum, and more

Product: Airframe and power generation; lethality, propulsion; on-board computing, etc.

Announcement: UK picks 90 suppliers for the Hypersonic Technologies & Capability Development Framework (worth $1.3B)

OCT 2024

Entities: US DOD/Lockheed (US) and UK MOD

Product: Trident II D5 missile

Announcement: US DOD awarded Lockheed $3B for the production, support, and development of Trident II D5 missile systems in the US and UK. Includes a Foreign Military Sale (FMS) to the United Kingdom

DEC 2024

Entities: Northrop Grumman (US) and Northrop Grumman /A.W.Bell (AU)

Product: Titanium casting technology for guided weapons and explosive ordnance manufacturing capabilities

Announcement: Northrop Grumman Awards Contract to Further Australia's Guided Weapons Manufacturing Capability

APRIL 2024 EAR

JUL 2024

Entities: Lockheed (US) and UK MOD

Product: Mako missile

Announcement: Lockheed Martin is prepared to develop a jet-fired hypersonic missile in the UK before making it in America, saying "such technology-sharing was now possible under the AUKUS agreement"

JAN 2025

Product: Miniature Radar Altimeters (MRA)

Entities: Chemring (UK) via its subsidiary Roke and US DOD

Announcement: Chemring wins major US contract for missile radars. The four-year contract is valued at $32M, with production commencing at the firm's Hampshire headquarters in October 2025

Review Stage: Post-Implementation

1 Effectiveness Assessment

2 Impact Assessment

3 **Administration & Enforcement**

- Use of Adequate Terminologies
  - *Did industry understand the language?*
- Adequate Time
  - *Has enough time passed to see the effects take place?*
- License Application Trends
  - *By how much did license requests change after implementation?*

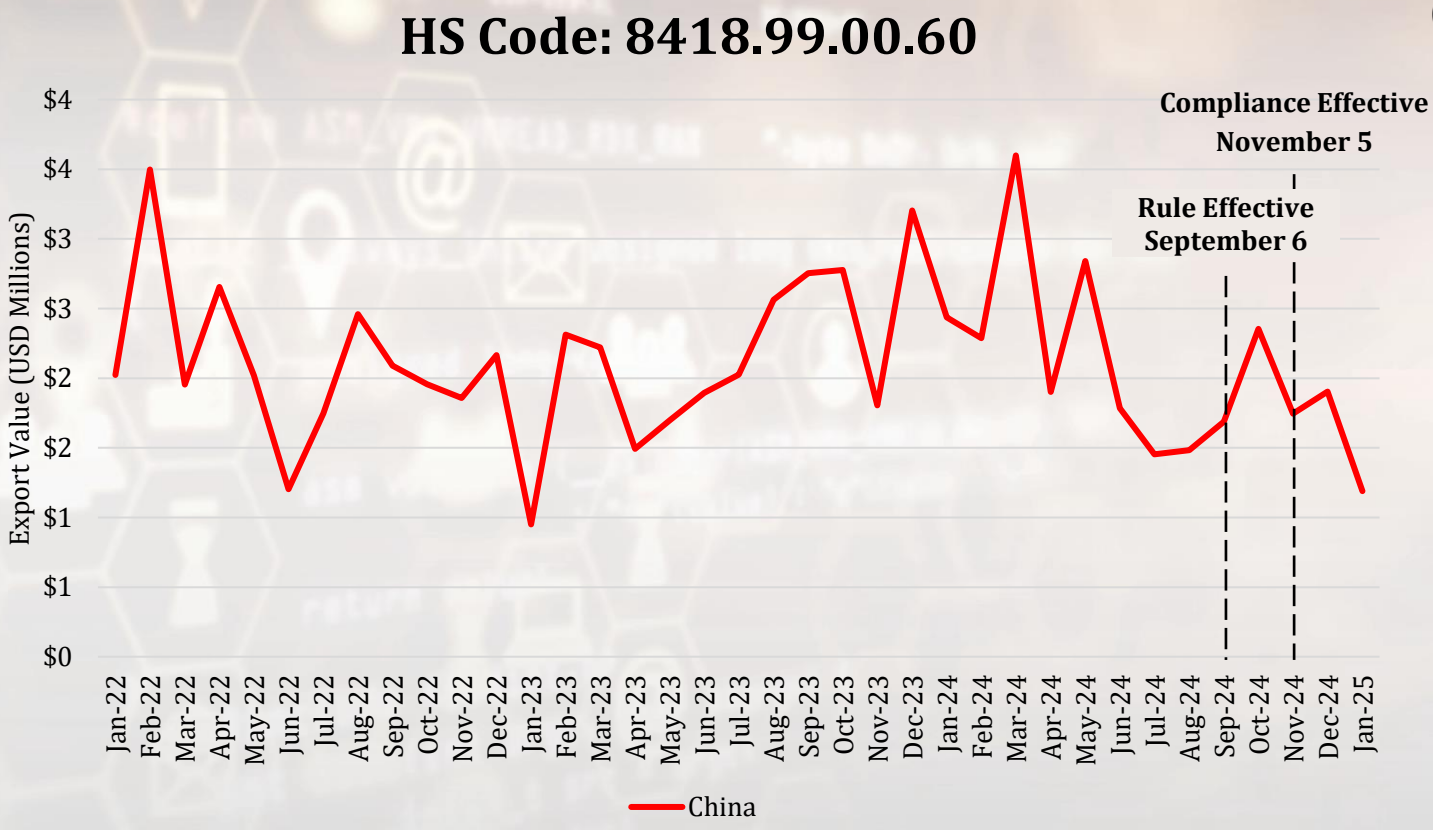
- **Export Administration:** Adequate Terminologies, Adequate Time, License Application Trends
- **Export Enforcement:** Enforcement Complexities, International Support

Quantum ECCN: 3A904

- 3A904: **Cryogenic cooling systems** and **specified components**, as follows (see List of Items Controlled)
  a. Systems rated to provide a cooling power greater than or equal to 600 µW at or below a temperature of 0.1 K (−273.05 °C) for a period of greater than 48 hours;
  b. Two-stage pulse tube cryocoolers rated to maintain a temperature below 4 K (−269.15 °C) and provide a cooling power greater than or equal to 1.5 W at or below a temperature of 4.2 K (−268.95 °C).

- License Requirements Reason for Control: **NS, RS, AT**

U.S. Exports of 8414.99.00.60 (Quantum)



***Note**: HS Code 8418.99.00.60 includes Parts Of Refrigerators, Freezers and Other Refrigerating or Freezing Equipment*

China has seen a **31.8% drop** since ECCN 3A904 took effect on November 5th, but **it's too early** to assess the **control's effectiveness**. The lack of a specific HS code for cryogenic cooling systems in quantum systems also leads to inconclusive trade data analysis.

For example, to better assess ECCN 3A904's effectiveness and promote evidence-based policymaking, BIS could consider advocating to the USITC for further **specificity** of the **existing HS code**.

Ways to Improve Measuring Effectiveness

1. Enhance HS Code to ECCN mapping for increased visibility into shipment tracking
2. Increase machine-readable by AI/ML systems for HS Codes and ECCNs descriptions, Consolidated Screening List
3. Improve Industry and BIS feedback loop

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MARCH 18-20, 2025

Q&A

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Appendix

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MARCH 18-20, 2025

Semiconductor Manufacturing Equipment Trade

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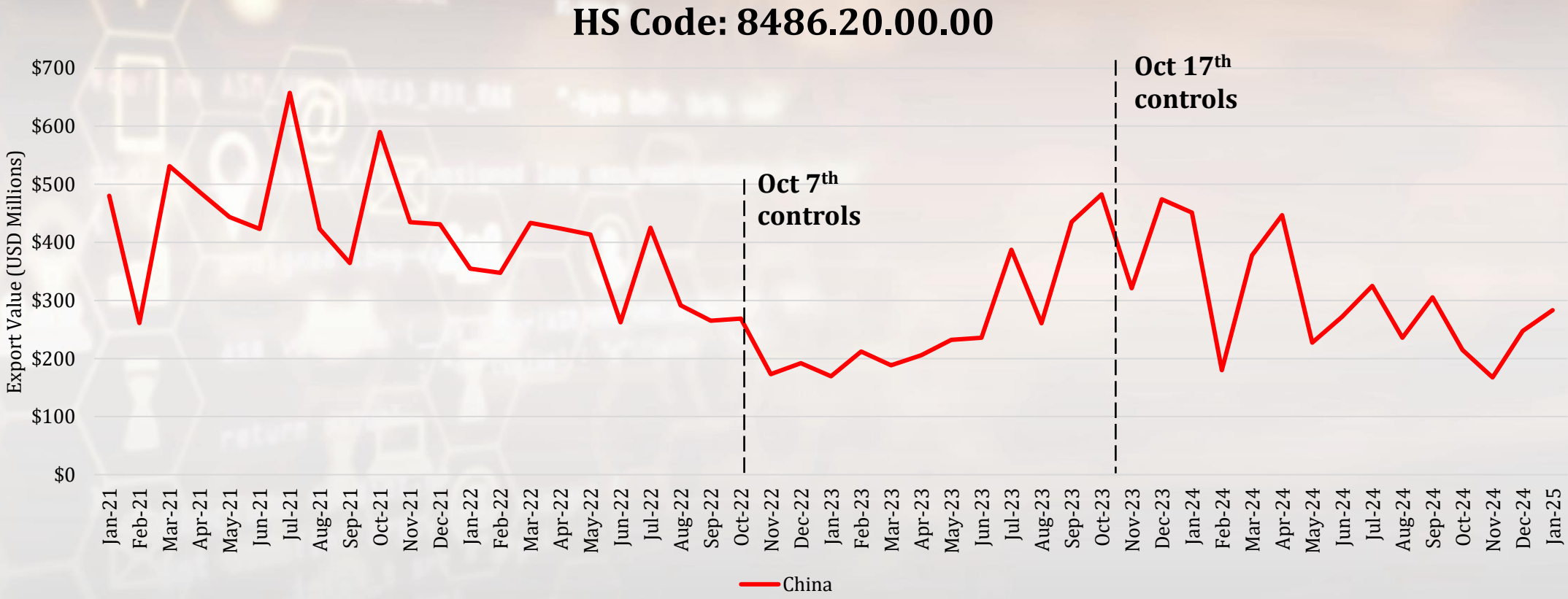
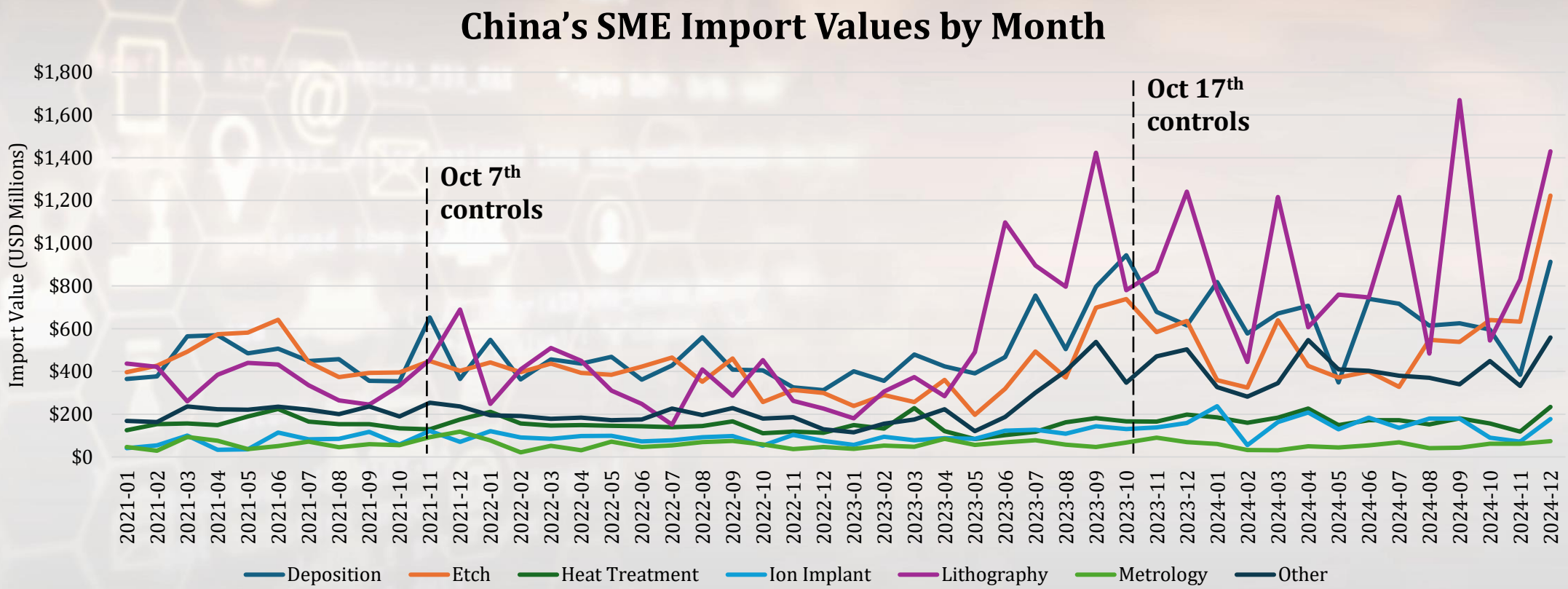
U.S. Exports of SME to China



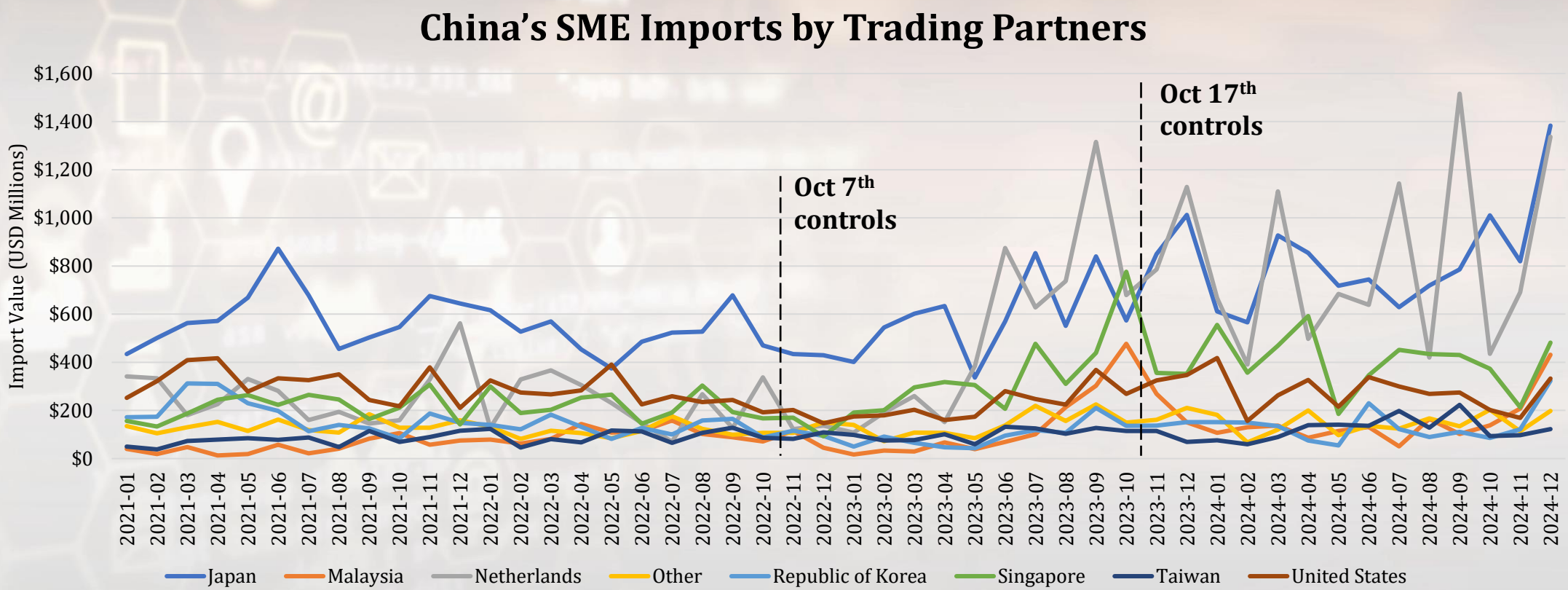
***Note**: HS Code 8486.20.00.00 includes Mach/apps For Mfr Of Semiconductor Device/ Ic*

China's Imports of SME



***Source**: GACC*

China's SME Imports by Trading Partners



***Source**: GACC*

Legacy SME

Tokyo Electron Says Chinese Firms Are Buying Up Legacy Chip Tech

- Chip gear maker predicts strong demand from China to continue
- Company sticks to outlook despite delays in foundry spending

A cleanroom at a Tokyo Electron Ltd. plant. *Source: Tokyo Electron Ltd.*

- "Our Chinese clients are well aware of the restrictions and have reworked their strategies," said Hiroshi Kawamoto, head of Tokyo Electron's finance unit. The company's **seen no impact on operations or sales from Japan's new curbs on shipments of chipmaking equipment**, effective last month, he said."
- "The **boost from China is helping Tokyo Electron** as spending slows down elsewhere amid a market slump that's stoking uncertainty in the global chip arena."

Source: *Bloomberg*

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UPDATE CONFERENCE ON EXPORT CONTROLS AND POLICY

MARCH 18-20, 2025

SME Manufacturers Revenue

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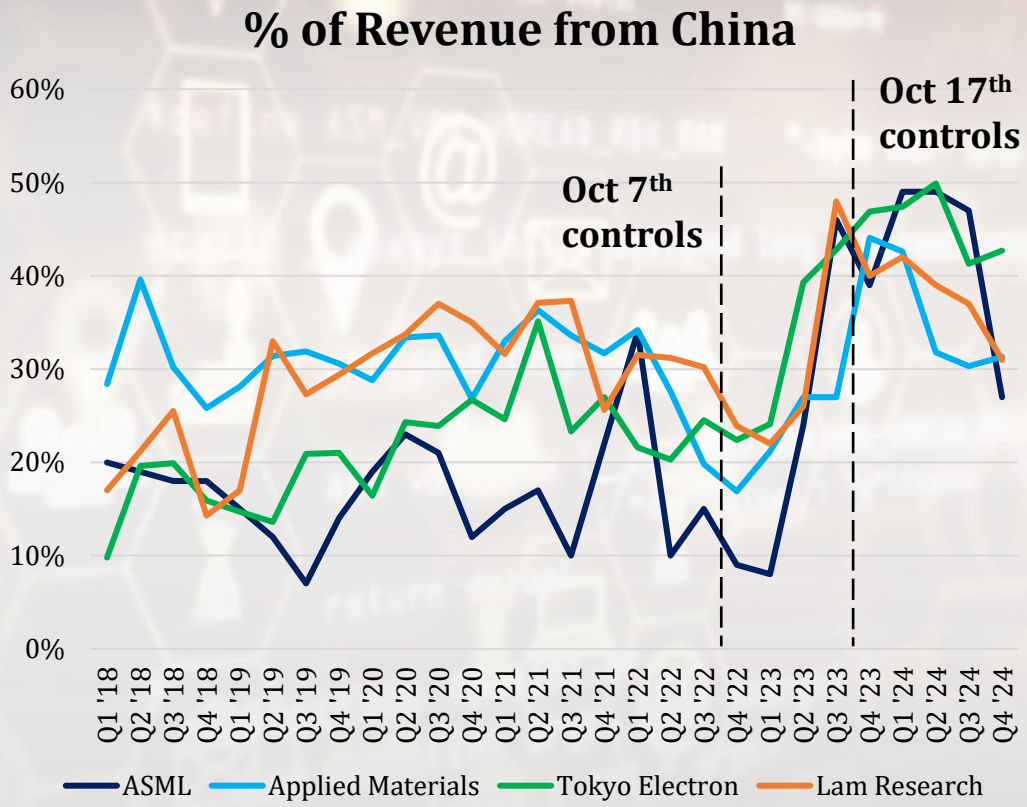
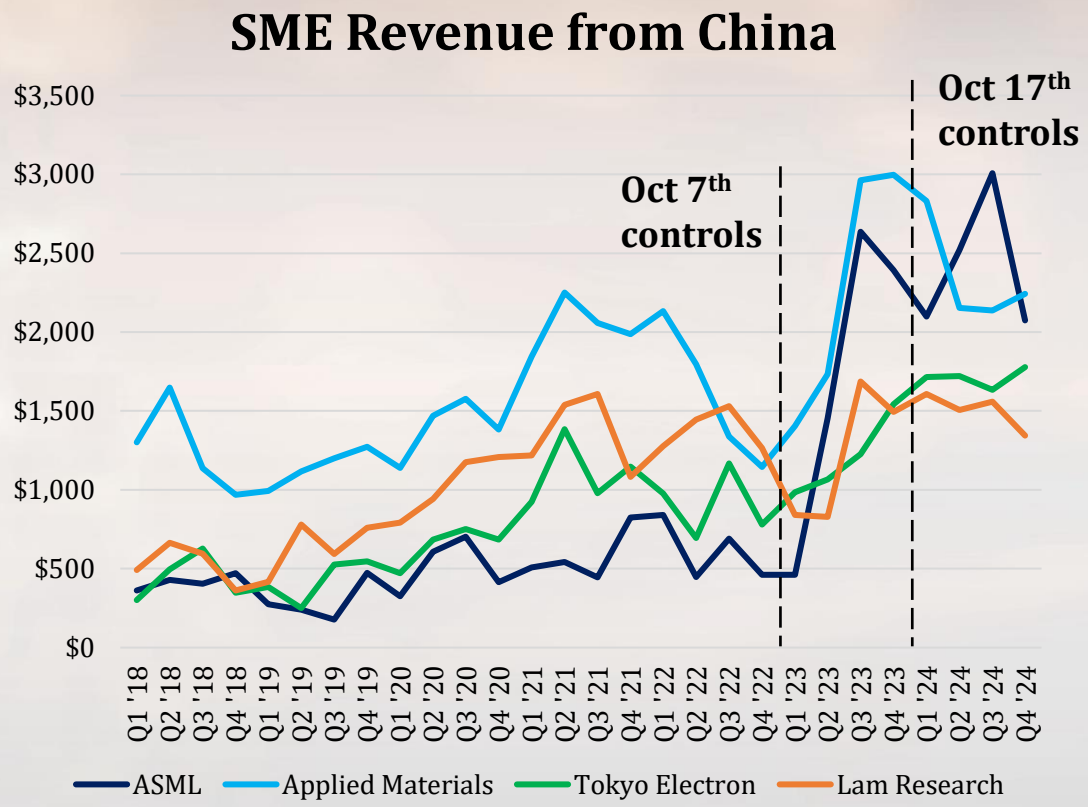
SME Manufacturers Revenue to China





***Source**: Corporate Fillings*