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AI COMPUTE INFRASTRUCTURE

AI Compute Hardware Trade Exposure And Supplier Position

A client-facing screen for AI chips, compute systems, semiconductor inputs, and fabrication equipment

PREPARED BY SYMBIOSIS UNITED ANALYTICS | VERSION 1.0

2024 U.S. CHINA-ORIGIN IMPORTS	TOTAL U.S. PLATFORM IMPORTS	GLOBAL CHINA-ORIGIN EXPORTS
$10.40B	$164.54B	$307.52B
ALLIED CHINA-ORIGIN IMPORTS	**U.S. IO FOOTPRINT**	**FOOTPRINT MULTIPLIER**
$100.49B	$15.31B	1.47x

CLIENT DECISION THIS REPORT SUPPORTS

Use this report to separate AI compute exposure into four questions that are often conflated: where the United States buys compute hardware, where China is commercially central, which supplier platforms are visible outside China, and which downstream U.S. sectors carry the production-network footprint.

Executive Brief For Decision Makers

AI compute exposure is not a simple China-import story. The direct U.S. China-origin share is only one part of the problem; the larger management issue is that AI compute hardware combines high-value chips, compute-system parts, specialized equipment, and supplier platforms that move through different countries and different qualification regimes. BACI records $164.54B of 2024 U.S. imports in the AI compute hardware platform, including $10.40B from China. China supplies 6.3% of measured U.S. imports in this platform, while China-origin exports to all destinations total $307.52B, or 20.7% of global trade in the measured HS6 universe.

The report's first point is segmentation. Compute systems is the largest U.S. import group in the screen, and Digital processing units is the largest individual HS6 product lane. That does not imply that all exposure should receive the same action. Some lanes are primarily allocation and working-capital issues; others are supplier-qualification problems; still others require export-control, safety, firmware, or customer-approval review before a sourcing decision is meaningful.

The input-output screen translates the direct China-origin flow into U.S. production-network incidence. Using the 2020 OECD ICIO matrix, the direct $10.40B China-origin flow generates a modeled $15.31B U.S. gross-output footprint and a $7.71B value-added footprint. This is not a forecast and not a causal pass-through estimate. It is a disciplined exposure screen that turns customs flows into a map of downstream sectors that may feel the constraint.

Bottom line. The most useful management move is not to announce a generic China-exit strategy. It is to split the platform into decision lanes: protect price and delivery where purchases are active, qualify alternatives where origin concentration is high, maintain monitored exposure where substitution is not binding, and escalate product-specific legal or engineering review where HS6 evidence is too broad.

CLIENT RELEVANCE

Use this report when procurement, finance, compliance, data-center strategy, and industrial-policy teams that need a public-data screen before reviewing supplier-specific bills of materials, export-control classification, and capacity contracts. The client-ready next step is to translate this public HS6 screen into an HTS10–ECCN–supplier–customer exposure register with named owners for compute units, ICs, wafer inputs, semicap equipment, test equipment, and repair/parts lanes.

Action Table

Business problem	Evidence	Recommended action	Horizon	Confidence
Compute allocation	U.S. exposure is largest in processing units, digital ICs, and ADP parts; China is visible but not the only origin.	Map chip, board, server, and parts lines separately before making a China-exit claim.	0–90 days	High
Export-control boundary	HS6 trade data cannot classify node size, accelerator performance, end-use, or license status.	Pair the trade screen with ECCN, HTS10, supplier, and customer-use review.	Immediate	High
Supplier resilience	Alternative-origin platforms are visible, but they differ by product group and may be capacity-constrained.	Build a dual-source register around qualified suppliers, packaging, test, and repair lanes.	0–12 months	Medium-high
Working capital	High-value compute imports create inventory and payment-timing exposure even when direct China share is modest.	Stress test landed cost, lead time, and credit-line needs for top compute hardware lanes.	0–6 months	Medium
Strategic investment	Equipment and test instruments are bottleneck complements to chip supply, not substitutes for it.	Separate supply assurance for chips, fabrication equipment, testing, and compute-system integration.	6–36 months	Medium

1 Scope And Method

This report estimates trade exposure and production-network incidence for the AI compute hardware platform. The product platform includes 23 BACI HS02 six-digit products grouped into 5 operating functions. The AI compute platform is an HS6 proxy. BACI HS02 does not isolate GPUs, tensor-processing units, advanced AI accelerators, wafer node, packaging type, export-control status, or end-use. It measures broad digital integrated circuits, compute units, semiconductor devices, wafer inputs, and selected semiconductor manufacturing and test equipment.

The analysis uses two linked data systems. First, BACI HS02 V202601 provides bilateral product trade from 2005 through 2024. Values are reported in thousands of current U.S. dollars and quantities in metric tons. Second, the OECD ICIO 2023-edition small table provides a 2020 input-output matrix in current million U.S. dollars. For each country-industry column j, the technical coefficient is:

$$a_{ij} = \frac{z_{ij}}{x_j},$$

where z_{ij} is intermediate input flow from sector i to use sector j, and x_j is gross output. The downstream exposure model uses the U.S. domestic price-pressure inverse:

$$p = (I - A'_{US})^{-1} s,$$

where s is the vector of direct China-origin platform exposure allocated to U.S. use sectors. The method is descriptive. It is designed to prioritize diligence, not to predict realized margins, prices, shipment delays, or substitution success.

2 Direct Trade Exposure

The U.S. platform totals $164.54B in 2024 imports. China-origin imports are $10.40B, which means the measured China share is 6.3%. The largest U.S. import function is Compute systems at $99.77B; its China-origin share is 8.0%. These figures are useful because they show where executive attention should begin, but they do not settle whether a product can actually move. Qualification, product specification, legal classification, and customer approval remain product-specific.

Operating function	U.S. imports	From China	China share	HS6 count
Compute systems	$99.77B	$8.02B	8.0%	4
Integrated circuits	$40.14B	$1.63B	4.1%	3
Semiconductor devices	$21.73B	$582.9M	2.7%	5
Wafer and material inputs	$1.56B	$142.9M	9.2%	1
Semicap equipment	$1.34B	$28.7M	2.1%	2

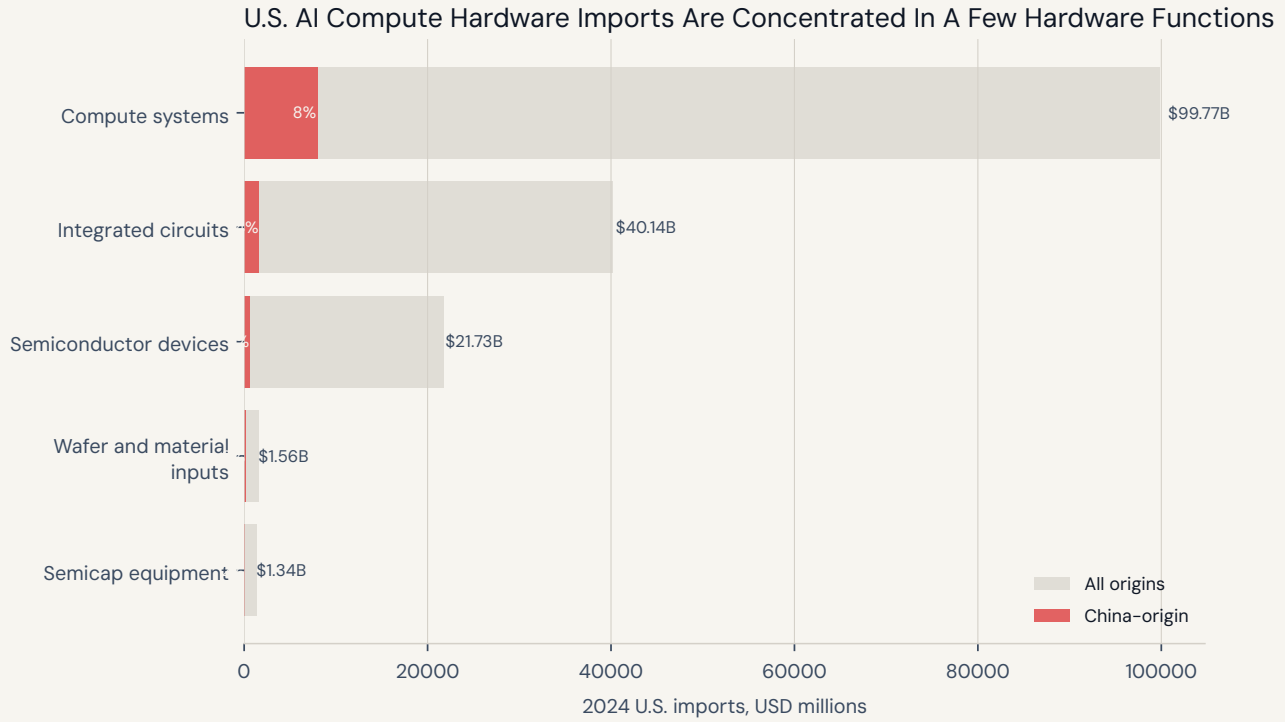

Figure 1: 2024 U.S. import exposure by operating function. Bars show total U.S. imports and the China-origin component in the HS6 proxy platform.

HS6	Product proxy	U.S. imports	From China	China share	HHI
847150	Digital processing units	$59.97B	$561.5M	0.9%	0.51
854221	Digital monolithic ICs	$38.85B	$1.49B	3.8%	0.16
847330	ADP parts and accessories	$35.68B	$6.52B	18.3%	0.16
854140	Photosensitive/LED devices	$18.86B	$235.6M	1.2%	0.16
847149	ADP systems	$2.54B	$342.4M	13.5%	0.22
854129	Other transistors	$1.66B	$163.5M	9.9%	0.09
847141	ADP units with CPU/input/output	$1.59B	$597.4M	37.6%	0.22
381800	Doped wafers/discs	$1.56B	$142.9M	9.2%	0.22

The HHI column measures origin concentration inside U.S. imports for each HS6 product. High China share and high HHI signal a substitution problem; high import value with low China share signals a working-capital, allocation, or monitoring problem; high strategic relevance with low measured customs value can still be urgent if the product is safety-critical or customer-qualified.

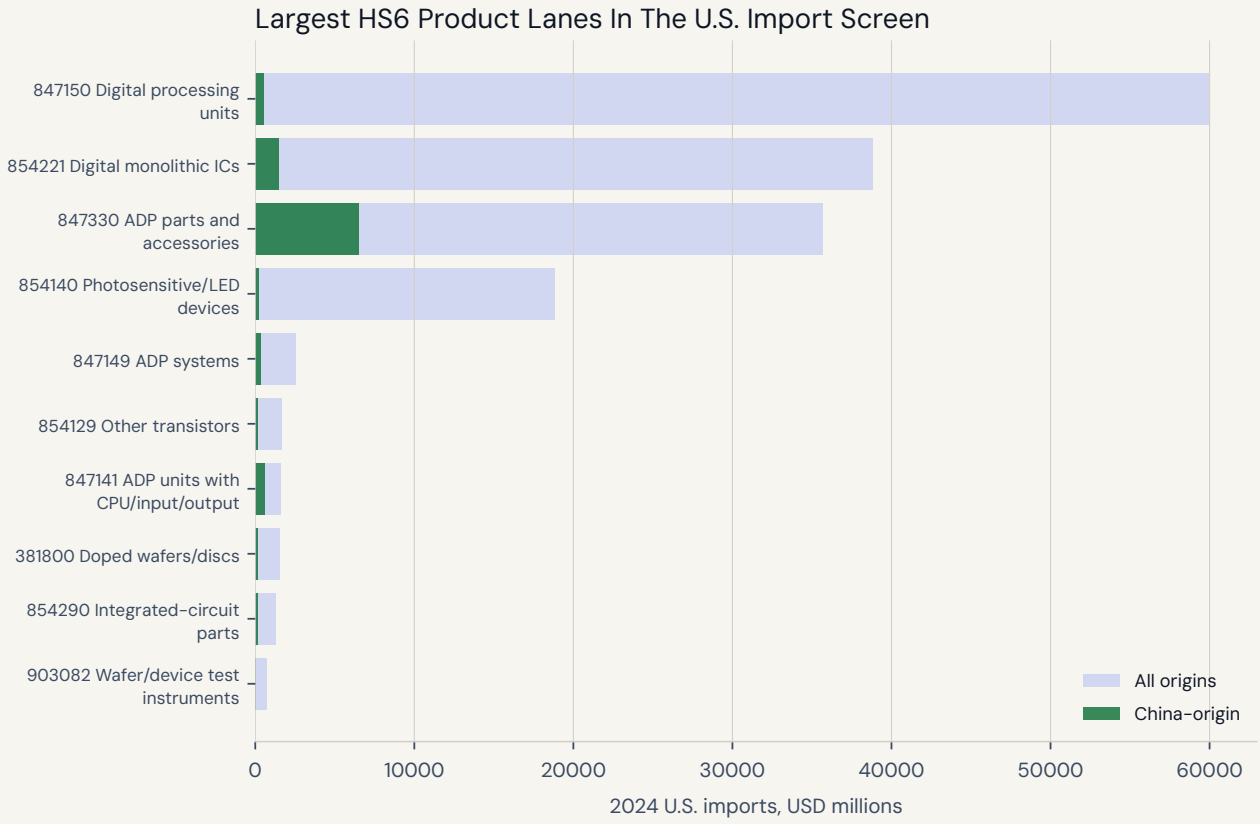

Figure 2: Largest HS6 product lanes in the 2024 U.S. import screen. The China-origin component is shown inside the broader import base.

3 Time Trend And China Position

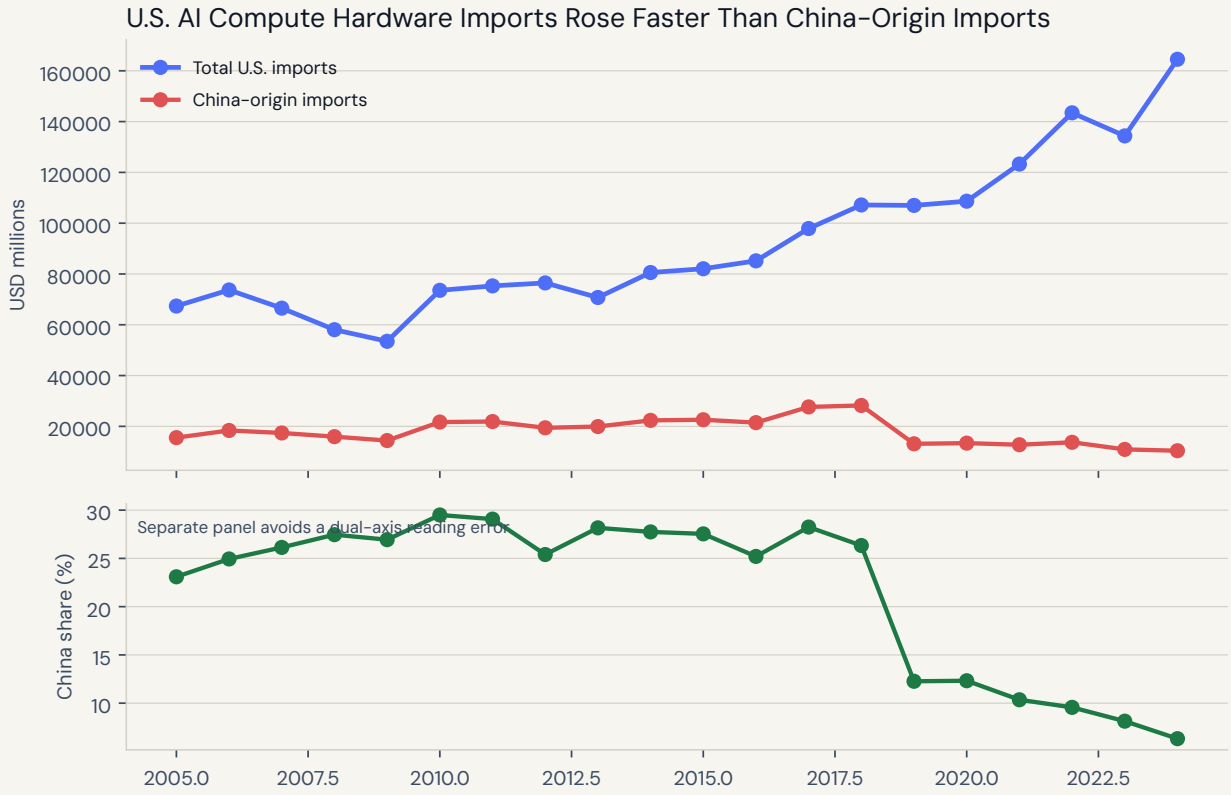

Figure 3: U.S. platform imports and China-origin share, 2005–2024. Values are current U.S. dollars in the BACI HS6 proxy universe.

U.S. imports in the platform increased from $67.37B in 2005 to $164.54B in 2024. China-origin U.S. imports increased from $15.56B to $10.40B. The time series therefore separates scale from dependence: a platform can become larger and more strategically important even when its measured China share does not rise one-for-one.

China's position is global, not only bilateral. China-origin exports in the platform are $307.52B, and China-origin shipments to allied economies in the report definition are $100.49B. That allied pool is important for client work because substitution pressure often arrives through customer requirements, government procurement rules, or resilience mandates even when the immediate U.S. customs exposure is manageable.

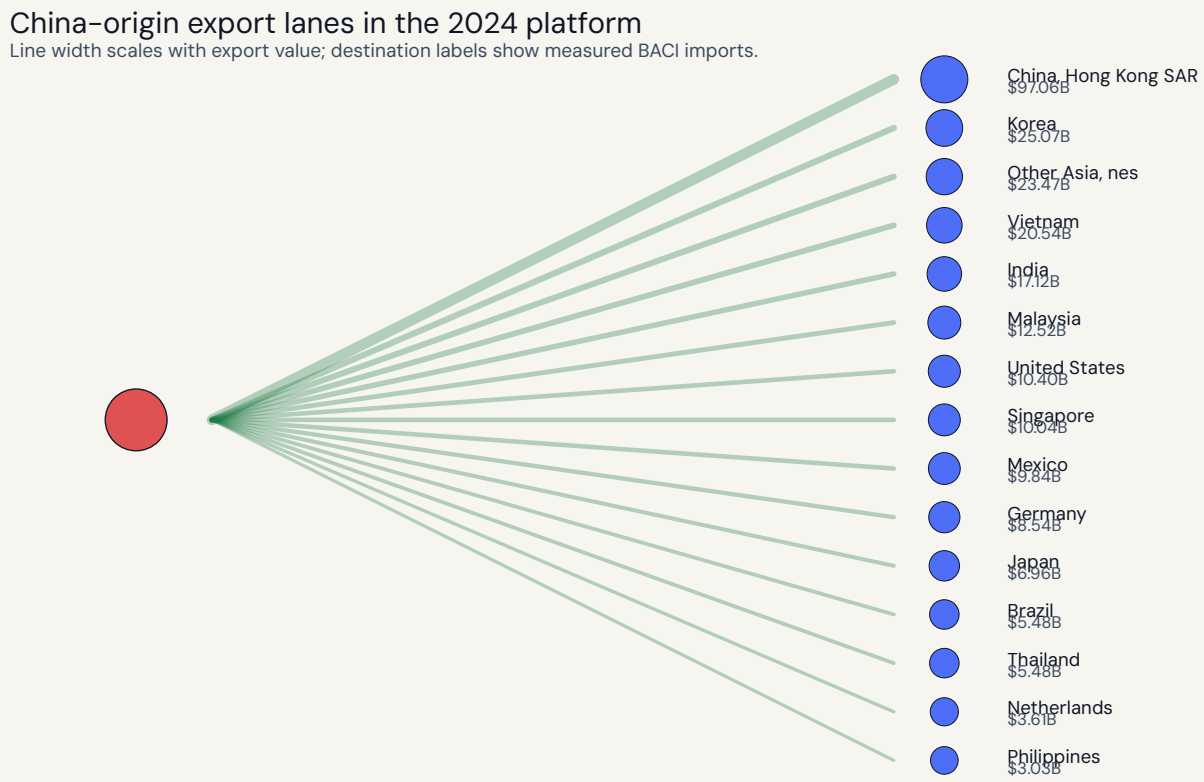

Figure 4: Largest China-origin 2024 export lanes in the platform. Line width reflects trade value; destination labels show measured BACI import values.

4 Supplier Platforms And Substitution Screen

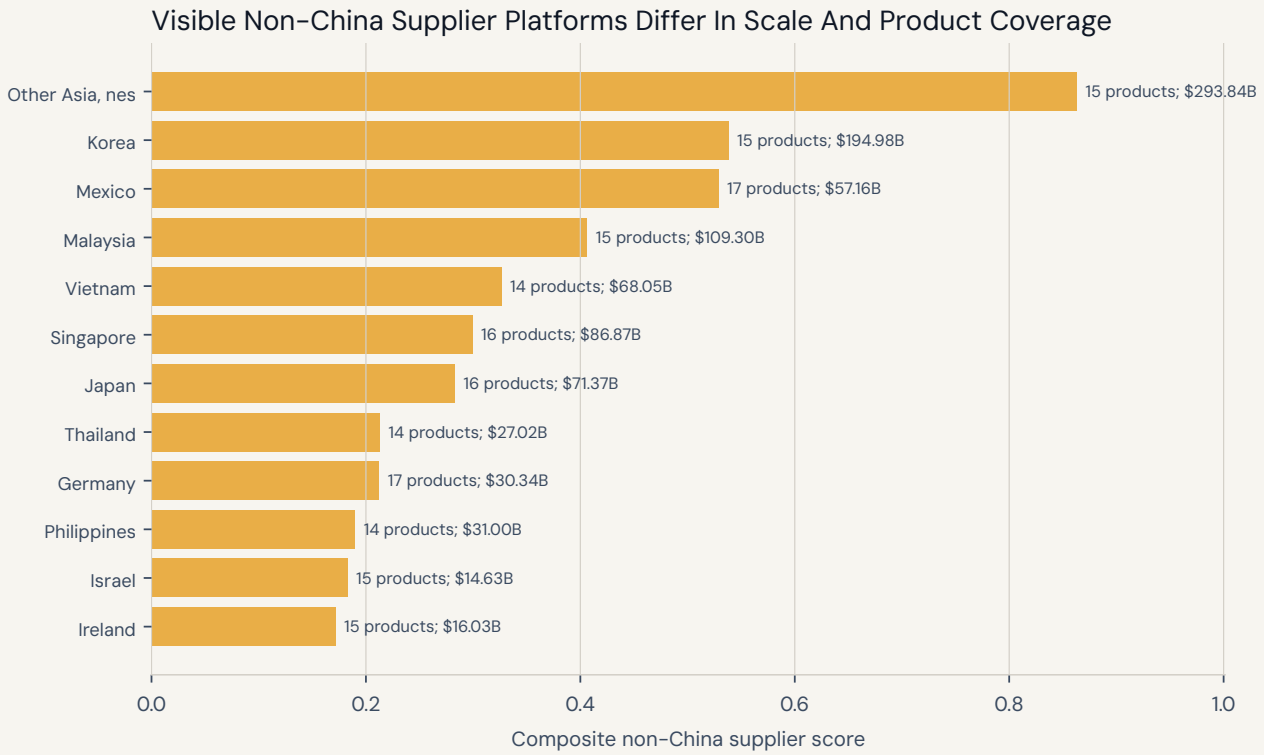

Figure 5: Visible non-China supplier platforms in 2024. The score combines global export scale, U.S. import presence, and product coverage across the HS6 platform.

The substitution screen is not a list of approved suppliers. It is a way to distinguish visible trade platforms from narrative alternatives. Countries that score highly already export across multiple products and appear in U.S. import lanes. That visibility reduces search cost, but it does not prove spare capacity, quality fit, licensing eligibility, firmware support, safety certification, or customer approval.

Candidate origin	World exports	U.S. imports	HS6 count	Score
Other Asia, nes	$293.84B	$35.78B	15	0.86
Korea	$194.98B	$10.57B	15	0.54
Mexico	$57.16B	$47.09B	17	0.53
Malaysia	$109.30B	$13.91B	15	0.41
Vietnam	$68.05B	$14.20B	14	0.33
Singapore	$86.87B	$1.11B	16	0.30
Japan	$71.37B	$2.96B	16	0.28
Thailand	$27.02B	$7.34B	14	0.21

5 Input-Output Propagation

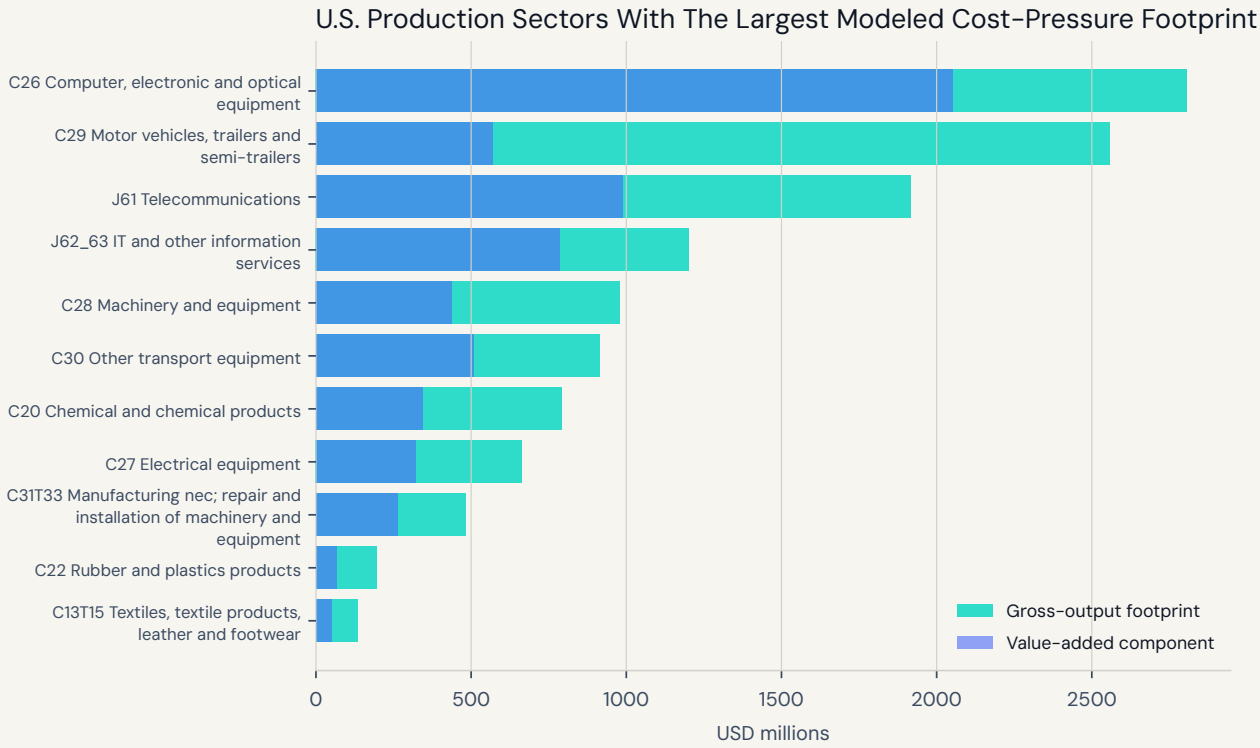

Figure 6: U.S. downstream sectors with the largest modeled gross-output and value-added footprint. The screen allocates direct China-origin platform exposure through the U.S. ICIO production network.

The model allocates direct China-origin platform exposure into U.S. use sectors and applies the domestic input-output inverse. The resulting gross-output footprint is $15.31B, or 1.47 times the direct China-origin flow. The value-added component is $7.71B. The interpretation is cost-pressure incidence, not realized pass-through. It tells a client where to ask the next operational question: which business unit uses the hardware, which suppliers are qualified, which customer contracts permit cost recovery, and which product lines cannot tolerate downtime.

ICIO	U.S. use sector	Direct	Gross output	Value added
C26	Computer, electronic and optical equipment	$2.69B	$2.81B	$2.05B
C29	Motor vehicles, trailers and semi-trailers	$2.02B	$2.56B	$570.2M
J61	Telecommunications	$1.64B	$1.91B	$989.2M
J62_63	IT and other information services	$1.08B	$1.20B	$785.0M
C28	Machinery and equipment	$782.2M	$978.2M	$438.4M
C30	Other transport equipment	$687.5M	$912.4M	$508.4M
C20	Chemical and chemical products	$612.4M	$790.5M	$342.6M
C27	Electrical equipment	$525.8M	$664.0M	$322.2M

6 90-Day Client Action Plan

The first operating cycle should convert the public screen into named owners and dated decisions. Procurement should rank the top HS6 products by import value, China share, origin HHI, and business criticality. Trade compliance should map HS6 proxies to HTS10, origin documentation, and any applicable controls. Finance should stress test landed cost, inventory timing, working-capital needs, and customer recovery. Engineering or operations should decide which products can be dual-qualified and which require redesign, recertification, or customer approval.

Timing	Decision focus	Owner set	Output
Day 0–30	Convert HS6 exposure into HTS10, supplier, site, customer, and contract records.	Trade compliance, procurement, finance	Exposure register with named owners.
Day 30–60	Split products into price-protection, dual-qualification, redesign, and monitor-only lanes.	Procurement, operations, legal	Decision lane for each major product family.
Day 60–90	Validate alternative origins, quality gates, lead times, firmware/calibration needs, and customer-approval constraints.	Engineering, quality, procurement	Qualification plan and exception list.
Quarterly	Refresh BACI screen, policy changes, supplier market signals, and customer requirements.	CFO, COO, category leaders	Updated platform risk memo.

7 Technical Appendix

Data. The analysis uses CEPII BACI HS02 V202601 bilateral goods trade with local HS-to-ISIC mappings for 2005–2024. Values are current U.S. dollars. Product descriptions and HS6 concordance text come from the BACI product concordance in this repository.

Input-output model. The ICIO screen uses the OECD ICIO 2023-edition small table for 2020. Direct China-origin platform imports are allocated to selected U.S. use sectors using 2020 intermediate input shares from the relevant broad ICIO input sectors. The resulting footprint is a descriptive cost-pressure screen.

Limitations. The report does not identify firm suppliers, contractual prices, product-grade differences, export-control classifications, safety certifications, firmware dependencies, customer approvals, or real-time capacity. The product scope is broader than AI-only hardware. The report is intended for prioritization before client-specific diligence, not as a final sourcing decision.