

RESEARCH REPORT

Tracing production through changes in trade geography

A change in direct import partners can exceed the shift in upstream value added. Official production evidence and reproducible supply-chain examples distinguish relocation, supplier development, ownership, routing, and the dependencies relevant to resilience.

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The question behind a new import partner

A shift in the country recorded as the origin of a U.S. import does not establish an equal shift in the origin of the value added embodied in that import. Final assembly can move while upstream inputs continue to come from established suppliers. Domestic suppliers can expand around the new assembly operation over time. A shipment can also be routed through another location without changing its origin under the applicable customs rules. These are different economic and legal events.

The distinction matters for assessing industrial development, supply-chain resilience, and the effect of trade measures. Gross trade data identify border transactions. Production accounts identify where income is created. Ownership data identify who controls the firm. None can substitute for the others. A foreign-owned factory can create local value added, while a locally owned exporter can rely heavily on imported inputs.

This report uses official evidence from Mexico and Viet Nam and the OECD's value-added framework to establish those boundaries. It then presents a reproducible hypothetical supply chain in which direct U.S. sourcing changes much more than upstream Chinese value added. A second input-output example shows how repeated intermediate transactions can make gross trade exceed the value of the final product. Neither example estimates the actual content of a country's exports.

What official evidence can and cannot establish

A [June 2026 Federal Reserve study of Mexico’s role in U.S. supply chains](#) distinguishes several sources of export growth after the 2018-2019 tariffs. Its framework separates broader trade diversion, production relocation associated with China, and transshipment. The study’s existence is itself a reason not to infer one explanation from a change in bilateral imports alone: the authors need a specified empirical decomposition to distinguish the channels.

INEGI’s [December 2025 report on Mexico’s global manufacturing export value added](#) separately identifies imported inputs, domestic intermediate consumption, and gross value added in its defined manufacturing perimeter. Its VAEMG measure combines particular domestic components under that methodology. It should not be assumed to equal every OECD TiVA concept or to describe all Mexican exports.

Viet Nam’s [January 6, 2026 government account of 2025 trade](#), reporting national statistical results, identifies the United States as the largest export market and China as the largest goods supplier. It reports that foreign-invested enterprises, including crude oil, accounted for 77.3% of exports. That ownership classification does not measure the foreign value-added share of those exports.

These sources identify complementary relationships. They do not establish that each imported Chinese product becomes an export to the United States, or that foreign ownership means the absence of local production. Matching the two trade flows requires evidence about products, firms, production stages, timing, and the use of inputs. Aggregate co-movement alone does not supply that match.

The measurements need different labels

Measurement	What it follows	Question it cannot answer alone
Customs gross trade	Goods crossing a border under the applicable statistical assignment	Origin of every upstream contribution to value
Input-output value added	Income generated through direct and indirect production	Legal origin of an individual shipment
Foreign direct investment	Ownership and financing relationships under its definition	Domestic content or actual factory output
Company sales	Revenue within a corporate perimeter	Territorial production in one country
Shipping route	Physical movement through ports and logistics nodes	Whether production or origin changed

A change in trade geography can appear in one measure before another. An ownership acquisition can precede production. A factory can begin operating before its supplier network develops. A new shipping route can appear immediately without new fixed capital. The observation should be described at the stage it records rather than presented as a complete relocation of the production chain.

The relevant boundary also depends on the policy question. Tariff administration concerns product origin and the governing measure. Resilience concerns the ability to maintain supply under disruption. Industrial development concerns local capability, income, and productivity. A sourcing change can improve one objective while leaving another partly unresolved. The evaluation should state the objective rather than use decoupling or diversification as an undefined result.

A transparent direct-sourcing example

Assume a U.S. purchaser buys a final manufactured product worth 100 monetary units. In the initial case, production and assembly are centered in China. Of the final value, 70 units originate as Chinese value added, 10 are previously produced U.S. inputs that return in the product, and 20 originate in other economies. The product’s gross U.S. import value is 100, while foreign value added embodied in it is 90.

Now assume assembly and a defined portion of production move to Mexico. The final product still costs 100. It embodies 50 units of Chinese value added, 30 of Mexican value added, 10 of U.S. value added, and 10 from other economies. For the example, assume the production transformation supports the relevant statistical origin assignment to Mexico. That is an explicit assumption, not a determination under any actual origin rule.

Origin of value added	Initial production chain	Assembly and production shift	Deeper local supplier development
China	70	50	30
Mexico	0	30	50
United States	10	10	10
Other economies	20	10	10
Final product value	100	100	100
Assumed direct U.S. import origin	China	Mexico	Mexico

Direct U.S. imports of this product from China fall from 100 to zero in the second case. Chinese value added falls from 70 to 50, a decline of about 28.57%, rather than 100%. Mexico adds genuine domestic production, but the upstream Chinese contribution remains material. The direct-partner change and the value-added change are therefore both real and different.

In the third case, further supplier development shifts another 20 units from Chinese to Mexican value added. The direct U.S. import origin remains Mexico, so bilateral gross trade alone would not reveal this additional localization. Chinese value added is now about 57.14% below the initial level. The example demonstrates that upstream adjustment can continue after the visible partner switch is complete.

The unchanged U.S. contribution also matters. Previously exported domestic inputs can return embodied in an import. Counting the entire import value as foreign income would miss them. This is one reason that value-added accounting and gross imports answer different questions even where there is no disputed origin or statistical error.

Routing is a separate case

Suppose the original product is simply shipped through a Mexican logistics facility without the production transformation assumed above. The shipping route changes, but that fact alone does not establish Mexican origin. The applicable customs rules determine the origin treatment. An analyst should not reassign a product's origin solely because a vessel or truck departed from a different location.

Handling, storage, packaging, and distribution can still create local services income. That income is economically real, but it differs from manufacturing the final product or its components. A careful account records the logistics contribution without treating the whole shipment as newly created local value. This distinction allows trade and services activity to be recognized without exaggerating industrial relocation.

It also prevents an unsupported allegation. Simultaneous increases in one country's imports from China and exports to the United States do not by themselves prove evasion. The imports may supply domestic demand, capital formation, or production of legitimately transformed exports. Establishing unlawful conduct requires transaction-level legal and factual evidence beyond the aggregate accounting considered here.

What value-added accounting adds

The OECD's [2025 TiVA indicator guide](#) distinguishes domestic and foreign value added in exports, indirect domestic contributions, returning domestic value added, and the origin of value added in final demand. Its detailed input-output framework tracks upstream relationships that a single customs shipment cannot show.

The edition documented in that guide covers 1995-2022. That reference period is distinct from its 2025 publication and later database revisions. Detailed structural tables should therefore not be presented as direct observations of a trade response occurring in 2026. More timely trade and production evidence is needed to assess recent changes, with the structural tables supplying a baseline rather than a current measurement by assumption.

The input-output approach also depends on aggregation. Firms within an industry can use different sourcing patterns, technologies, and export arrangements. An industry average does not establish the content of each product. A company seeking to assess a critical supplier needs more granular information than the national table alone, especially where a small input can interrupt production.

A two-economy input-output illustration

The next example is also entirely hypothetical. It uses only two producing economies, M and C, and a final purchaser outside both. Each unit of M's output requires 0.1 units of M's own output and 0.4 units of C's output. Each unit of C's output requires 0.2 units of M's output and 0.1 units of C's own output. The remaining amounts are value added: 0.5 per unit in M and 0.7 per unit in C.

With rows representing input suppliers and columns representing producers, the input-coefficient matrix is $A = \begin{bmatrix} 0.1 & 0.2 \\ 0.4 & 0.1 \end{bmatrix}$. Final demand is $f = [100, 0]$. Gross production satisfies $x = Ax + f$. Solving the two equations gives $x_M = 90/0.73$, approximately 123.2877, and $x_C = 40/0.73$, approximately 54.7945.

Reproducible calculation	Result
M gross output	123.2877
C gross output	54.7945
M value added, $0.5 \times M$ output	61.6438
C value added, $0.7 \times C$ output	38.3562
Combined value added	100.0000
C intermediate sales to M, $0.4 \times M$ output	49.3151
M intermediate sales to C, $0.2 \times C$ output	10.9589

M exports the final product for 100, but not all of that value originates in M. The chain creates approximately 61.64 units of value added in M and 38.36 in C. Intermediate goods circulate between the two economies, so gross production and gross cross-border transactions exceed the final value without creating extra final income each time the inputs move.

The determinant of $I - A$ is 0.73, and the value-added coefficients equal one minus each column's intermediate-input total. Those conditions make the accounting reproducible. The result is not a calibration for Mexico, China, or any other economy. It illustrates why upstream tracing requires a consistent production system rather than subtracting one bilateral trade flow from another.

Local value added can rise through several mechanisms

A new assembly operation can increase local wages, profits, purchased services, and demand for domestic inputs. The size of each contribution depends on technology, scale, workforce, and the supplier base. A lower initial domestic share does not imply that the operation has no developmental value. It identifies the starting point for assessing how capabilities evolve.

Over time, suppliers can qualify locally, managers and workers can acquire expertise, and additional production stages can become viable. These gains are conditional. They require demand, skills, infrastructure, finance, and reliable standards. A policy that subsidizes final assembly without addressing a binding upstream constraint may generate a different trajectory from one that supports effective supplier development.

The domestic share is not always the appropriate objective to maximize. Imported specialized inputs can improve productivity and access to export markets. Replacing them with higher-cost local inputs can increase a measured share while reducing competitiveness or total income. The economic test concerns additional useful capability and value, including the opportunity cost of support, rather than the percentage alone.

Prices also affect nominal shares. If imported input prices fall while physical quantities and production are unchanged, the domestic share of the final value can rise. A rise in local wages can have another effect. Volume measures, unit values, and product composition should be considered before a nominal share change is described as a technological improvement.

Domestic purchasing is not the full domestic contribution

A manufacturer can buy an input from a domestic supplier even when that input contains imported materials. The supplier’s location identifies the immediate transaction, while value-added tracing follows the production behind it. Counting the whole domestic invoice as domestic value added would overstate the contribution if imported content is embodied upstream.

Consider another hypothetical product worth 100. The final manufacturer buys foreign inputs for 60 and domestic intermediate inputs for 20, and creates direct value added of 20. Suppose the domestic intermediate invoice itself contains 8 of foreign value added and 12 of domestic value added. The final product then embodies 32 of domestic value added and 68 of foreign value added, rather than the 40/60 split inferred from the final manufacturer’s direct purchases alone.

Origin traced through the hypothetical chain	Domestic	Foreign
Final manufacturer’s own value added	20	0
Content of domestic intermediate purchases	12	8
Directly imported inputs	0	60
Total embodied value added	32	68

This is a reason to preserve the definitions of national indicators. A measure that adds domestic intermediate purchases to direct gross value added can be useful for its stated purpose without being identical to a full

multi-country value-added decomposition. The appropriate interpretation follows the methodology, valuation, and production perimeter. Different measures should not be ranked as competing estimates until those boundaries are reconciled.

Levels and shares tell different stories

A domestic share can decline while the amount of domestic income generated by exports increases. Suppose hypothetical exports rise from 100 to 150 while domestic value added rises from 40 to 54. The domestic share falls from 40% to 36%, a decline of four percentage points. Yet domestic value added increases by 35%. A claim that the economy captured less domestic value would be ambiguous unless it specified the share or level.

The converse is possible as well. A domestic share can rise when exports contract sharply, even while the domestic value generated falls. Composition can drive the result if products with high imported content decline more rapidly than others. The aggregate ratio may improve without an increase in capability within any product group.

This distinction affects policy targets. A target expressed only as a share can create an incentive to reduce imported inputs even where those inputs support a larger competitive export operation. A target expressed only as gross exports can overlook a limited domestic income contribution. A more informative evaluation follows the level and composition of domestic value added, productivity, and the cost of the policy together.

It also affects employment interpretation. Higher domestic value added can result from more workers, more hours, higher productivity, or changes in prices and margins. Job counts do not identify all of these channels. An industrial-development assessment should specify whether it seeks employment, skill formation, income, technological capability, or a combination, rather than treat every favorable indicator as proof of the same outcome.

Market access and economic content are different tests

A preferential trade arrangement can apply a product-specific origin rule with its own calculation. That test is designed for the arrangement and need not coincide with an input-output measure of national value added. Passing an origin requirement does not establish a particular TiVA ratio; a high domestic value-added share does not by itself establish eligibility under every origin rule.

The difference is relevant for sourcing decisions. A firm may need to qualify materials, retain records, or change a production stage to meet a market-access condition. Those actions can alter costs and the location of activity. Their economic benefit should be assessed against the actual preference or duty avoided and the full adjustment cost, rather than inferred from a national average share.

The policy comparison should also include downstream users. A requirement that raises the cost or reduces the availability of an input can affect domestic producers that use it. The gain to one stage of the chain and the cost to another should be assessed within a consistent perimeter. Counting the supported producer's extra sales while ignoring purchasers' costs would not establish the net domestic benefit.

These considerations do not imply that origin requirements or domestic capability objectives lack value. They define the evidence needed to evaluate them. The relevant question is whether the particular design produces the intended capability or access at a justified cost, under realistic sourcing and delivery conditions.

Ownership and production should remain separate

A foreign-invested firm can employ local workers and purchase local services while retaining imported technology and components. Its output contributes to domestic production according to territorial accounting, while income remitted to foreign owners affects the distribution of national income. Both relationships matter, but they answer different questions.

Viet Nam's reported foreign-invested export share is therefore not a direct estimate of foreign content. It identifies the ownership category of the exporting enterprise under the source's classification. The actual domestic value added requires evidence about its production and suppliers. The same caution applies to an exporter described as domestically owned.

For investment assessment, it is useful to identify who controls the technology, who bears production risk, and where the important assets and skills reside. Ownership can influence those relationships without determining them completely. Licensing, contract manufacturing, and multinational internal trade can separate legal ownership from the location of particular productive tasks.

A more demanding resilience assessment

A supply chain is diversified only relative to a specified disruption. Buying from factories in several countries can reduce exposure to a local natural disaster. It may provide less protection from a shortage of the common component used by all those factories. Geographic diversification at the final stage can therefore leave upstream concentration unchanged.

The relevant map should identify critical inputs, substitution times, inventories, and the location of technical knowledge. An input with a low cost share can be essential to the operation of the whole product. Value-added shares are informative about income exposure but are not a complete measure of operational criticality. A small contribution can still be a bottleneck.

Redundancy also has a cost. Maintaining several qualified suppliers, spare capacity, or extra inventories can raise normal operating expense. The benefit is a reduction in disruption losses. A policy or company assessment should compare those costs under explicit scenarios rather than assume that the highest local share or the largest number of suppliers is always optimal.

How to assess a recent geographic shift

The first step is to align the product, period, valuation, and statistical basis. Customs goods data and balance-of-payments trade are not identical. Monthly data can be affected by inventories, shipping schedules, and anticipatory imports. A change in an annual share should not be explained with a single month's shipment without testing the timing.

Partner statistics can also disagree because one system records shipment timing, valuation, or origin differently from another. Freight and insurance, re-exports, and revisions can contribute to those gaps. A mirror-data difference is a reason to reconcile methods before drawing a substantive conclusion; it is not, by itself, evidence of hidden production or false reporting. Preserving the original series and the reconciliation makes a subsequent interpretation auditable.

The second step is to connect trade with production. Employment, output, installed assets, imported capital equipment, and supplier purchases can help determine whether new activity is occurring. No single measure is decisive. A factory can import equipment before production begins, and employment can rise during installation. The sequence should be made explicit.

The third step is to trace upstream inputs at the most appropriate level. Input-output tables supply a consistent structural framework; firm and product evidence can refine it. Assumptions used to update old coefficients should be disclosed, especially when the purpose is to assess a recent disruption that may itself change sourcing. A model-based update should be labeled as such.

Finally, the comparison needs a counterfactual. A bilateral shift can reflect tariffs, wages, technology, transport costs, customer demand, or policy uncertainty. A credible causal claim must distinguish the intervention of interest from those other changes. Describing a new trade pattern is an important first result, but it is not yet a complete policy evaluation.

The relevant unit of comparison is therefore the production relationship, with its prices, ownership, and input requirements stated, rather than an isolated customs ranking.

Product prices and the interpretation of trade shares

Nominal trade shares can change through prices as well as quantities. If one supplier sells products whose prices rise sharply, its share of import value can increase without a corresponding expansion in physical deliveries. Exchange-rate movements and a shift toward more expensive specifications can have a similar effect. A claim about relocation should therefore inspect quantities or suitable volume measures where available and identify product-mix changes, rather than equate every movement in nominal value with a movement of productive tasks.

The same issue affects domestic value-added shares. A rise in the price of imported inputs can reduce the domestic share of gross export value even when domestic hours and physical production remain unchanged. Conversely, higher domestic margins can increase a measured share without additional domestic processing.

These are economically meaningful income changes, but they differ from a change in the location of physical production. An assessment should state whether it is tracing real activity, nominal income, or both.

The appropriate product detail depends on the question. A broad customs category can contain components, finished products, and different technical grades. A stable aggregate share can conceal an important shift inside it, while a changing aggregate can reflect demand moving between subcategories. Matching the product to the production stage improves the interpretation of both the bilateral evidence and any subsequent value-added model.

Conclusion

A change in direct import partners can represent genuine production relocation while leaving a substantial part of upstream value added in the original supplier economy. Further supplier development can then change value-added origins without another visible change in the direct partner. Routing, ownership, and production are additional distinctions that should remain explicit.

The official sources examined here demonstrate the need for these separate measurements. The hypothetical examples show the accounting directly and can be recalculated from the stated inputs. They support a more precise question about trade geography: which productive tasks, income sources, and critical dependencies changed, and which remained? That question provides a sounder basis for industrial and business decisions than the bilateral trade ranking alone.

For the underlying Chinese demand and production relationships, see [China's domestic expenditure and external production links](#). For the transaction-specific interpretation of duties, see [Reading a tariff measure beyond its headline rate](#).

Source addresses

The links below retain the source addresses cited in the analysis. References should be read within their stated periods and scope.

<https://www.federalreserve.gov/econres/notes/feds-notes/mexico-in-u-s-supply-chains-lessons-from-2018-19-tariffs-20260605.html>

https://www.inegi.org.mx/contenidos/saladeprensa/boletines/2025/pibval/VAEMG2024_RR.pdf

<https://en.baochinhphu.vn/viet-nams-foreign-trade-soars-to-all-time-high-in-2025-111260106092919875.htm>

<https://stats.oecd.org/wbos/fileview2.aspx?IDFile=2143f34e-6feb-41a9-abaf-cb52132608c4>