27 kg of lanthanum oxide can flip Japan's rare-earth price comparison

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Japan's non-China rare-earth compound imports can look cheaper or more expensive simply because the product mix changes. Across 2012-2025, replacing the actual mix with a common 2012 quantity basket reverses that comparison in five of 13 calculable years. But the alternative measure has its own weakness: in 2022 and 2023, the reversal depends on a lanthanum oxide category with only 27 kg and 70 kg of published non-China imports.

An observed price on 27 kg does not establish an alternative supply at commercial scale. This is a measurement question about supply-chain alternatives, not a survey of the rare-earth industry.

What we compared

We compared five Japanese import categories: cerium oxide, other cerium compounds, yttrium oxide, lanthanum oxide and other compounds under HS 2846.90. The data cover all transport modes, not the entire rare-earth supply chain.

Import unit value is recorded value divided by kilograms. We compared China and all other origins using each group's actual mix, then a common basket weighted by their combined 2012 quantities. That holds broad category mix constant, not product quality within categories.

The comparison changes direction

Year	Actual mix	2012 basket	Without lanthanum*
2012	0.75	1.41	1.47
2013	2.02	3.57	3.66
2014	1.77	1.50	1.53
2015	1.45	2.31	2.36
2016	1.53	2.04	2.06
2017	1.70	1.37	1.38
2018	1.75	0.83	0.84
2019	1.92	2.11	1.48
2021	0.96	1.93	1.46
2022	0.65	1.65	0.94
2023	0.68	1.56	0.90
2024	1.55	3.78	2.53
2025	1.98	6.45	2.97

Non-China / China import unit-value ratios. Below 1 means the non-China measure is lower. All 13 calculable years are shown. *Post hoc sensitivity: omit lanthanum oxide from both sides of the 2012 basket and renormalize remaining weights; actual mix stays five-category. 2020 fails five-category support and is not calculated.

The five reversals run in both directions: 2012 and 2021-2023 move from below to above 1; 2018 moves the other way. An equal-quantity basket does not reverse 2018, so the choice of common basket also matters.

A common basket can magnify a tiny trade flow

In 2022, the actual-mix ratio is 0.65, while the common-basket ratio is 1.65. Yet the non-China lanthanum oxide category contains just 27 kg, against about 1.3 million kg from China. Its high recorded unit value contributes about 44% of the non-China common-basket value, even though lanthanum has only about a 10% quantity weight.

A post hoc sensitivity check makes that dependence visible. Omitting lanthanum oxide from both sides of the common basket lowers its ratio to 0.94 in 2022 and 0.90 in 2023, from 1.65 and 1.56. This is a diagnostic, not a preferred replacement estimate. The actual-mix figures above still cover all five categories.

The issue persists beyond those reversal years. Both the 2022 and 2025 totals are 27 kg, each the sum of two published origin rows of 25 kg and 2 kg, with different origin combinations. In 2025, these 27 kg account for about 55% of the non-China common-basket value. A small observed flow cannot establish that comparable material could be supplied at scale at that recorded unit value.

What the evidence does and does not establish

The defensible result is that both product composition and very small trade flows materially affect this comparison. Broad customs categories do not match purity, grade, processing stage, contract terms or shipment characteristics. CIF import values also include freight and insurance. Neither the actual mix nor the common basket isolates a causal supplier premium.

Published quantities introduce a further limit. Japan's customs statistics truncate quantities before aggregation and apply confidentiality treatment. In 2020, non-China lanthanum oxide has positive published value but zero published kilograms. We therefore report no five-category basket comparison for that year; zero published kilograms does not mean no trade.

This work responds to the measurement question raised by BIS Bulletin 139 on supply-chain chokepoints. It is an annual Japan-only diagnostic using retained statistical vintages, not a replication of the bulletin's six-month moving averages or a test of its broader argument about processing dependence.

How to use this in supply-chain research

For analysts and policymakers, the next useful step is to separate changes in what is imported from changes in the cost of comparable material. That requires more detailed product specifications and shipment information, alongside evidence on supplier capacity and feasible volumes. The customs comparison tells us where that work is needed. It does not tell us whether diversification is cheap, costly or operationally available.

Sources and methods

CEVE, *Composition in Japanese rare earth import unit values*, revision 2, November 13, 2026, and its retained audit package. We recalculated all 13 rows and the lanthanum-omission column from the original annual customs CSVs. This is a CEVE calculation check, not external review. A reproducibility package with calculation code, tables and source data is available on request.

Japan Customs Trade Statistics; MOF/e-Stat 2025 fixed import file; Customs statistical FAQs. Source: Japan Ministry of Finance/e-Stat; CEVE calculations.

Banerjee, R., Chui, M. and Gambacorta, L., *Chokepoints in global supply chains: lessons from rare earths and hard disk drives*, BIS Bulletin 139, October 26, 2026.