Commodity Special Feature: Market Developments and the Economics of Rare Earths

Compared with the October 2025 World Economic Outlook *(WEO), the projections for commodity prices have been revised sharply upward. The military conflict in the Middle East has upended the outlook for energy and food as higher oil and gas prices increase the cost of fuels, petrochemicals, and fertilizers. Uncertainty surrounding the outlook for commodity prices remains very high, with risks tilted to the upside. A longer conflict than assumed in the WEO reference forecast would delay and substantially complicate the restoration of oil and gas production and exports to preconflict levels. At the same time, gold and other precious metal prices have retreated from their preconflict peaks. Despite elevated geopolitical uncertainty, retail investor profit taking—amid upward revisions to interest rate expectations and a stronger dollar—has reversed the near-parabolic gains recorded in the first two months of the year. Supply disruptions have driven base metal prices higher in markets already strained by strong demand and limited supply. Food prices have also increased as cereal prices have rebounded from historical lows, mainly as a result of growing weather concerns in large producing regions. Should the conflict linger on, higher transport and fertilizer prices, together with higher demand for biofuel feedstocks, could drive food prices higher. This Special Feature also examines the global implications of shortages in rare earth element markets, showing that such shortages could impose sizable GDP losses on importing countries. Avoiding trade tensions and restrictions remains the first-best outcome to promote a steady supply; de-risking supply chains through targeted industrial policies is fiscally costly, although less so if pursued simultaneously by various importers.*

Commodity Market Developments

Oil prices increased 57.6 percent between August 2025 and March 2026 to $105.8 per barrel as a result of the military conflict in the Middle East. Oil prices spiked in March as oil shipments through the Strait of Hormuz—a critical choke point with few alternatives for rerouting—stopped, curtailing about 8.5 million barrels per day (mb/d) of crude oil exports. Usually, about 20 mb/d of oil, equivalent to 20 percent of daily global oil consumption, flow daily through the strait, of which 15 mb/d is crude oil. Major oil-producing facilities were also shut down as a precaution or as storage ran out or was damaged. Global strategic and commercial inventories, standing at a five-year high of 8 billion barrels, offer only a partial buffer.

After reaching a peak of $119 on March 10, Brent prices retreated following first communication by the US administration that it expected the conflict to be short-lived and then the announcement of a ceasefire. The situation remains fluid and uncertainty is high. The futures curve is in steep backwardation (higher spot prices than futures prices), indicating supply disruptions and elevated geopolitical risk (Figure 1.SF.1, panel 2). If the conflict drags on, prospects of quickly restoring maritime transit and energy production to prewar levels diminish, with obvious ripple effects on refined product prices.

Middle East supply disruptions put upward pressure on European and Asian natural gas prices. Title Transfer Facility (TTF) trading hub prices in Europe rose by 61 percent between August 2025 and March 2026, peaking at $17.7 per million British thermal units (MMBtu). Asian liquefied natural gas (LNG) prices surged to $20.8 per MMBtu—an 80.6 percent increase since August 2025—as more than three-quarters of global LNG shipments through the strait (a fifth of global seaborne LNG) are destined for Asia. Prospects for a quick recovery of gas production and exports after the conflict have dimmed dramatically following strikes on the Iranian South Pars gas field, which prompted retaliatory strikes on Persian Gulf energy facilities, including Qatar's Ras Laffan gas field on March 18. At the same time, US Henry Hub prices rose by only 4.9 percent to $3 per MMBtu, as US LNG exporters are close to capacity, limiting the diversion of domestic gas production to LNG plants. Futures markets for TTF are in steady backwardation,

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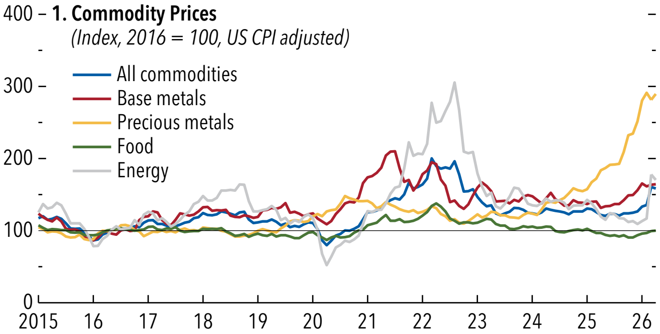
reaching $7.5 per MMBtu through 2031, thanks to an expected doubling of US export capacities by 2027. Henry Hub futures prices are expected to hover around $3.5 per MMBtu through 2031.

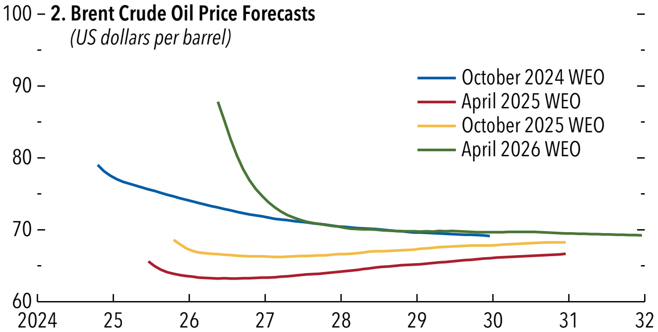
Retail traders unwound part of their bets on rising prices for precious metals, while supply disruptions put upward pressure on base metal prices. The IMF's metals price index jumped 36.6 percent between August 2025 and March 2026. Prices for precious metals led the surge, with gold up 44.4 percent and reaching record prices exceeding $5,000 per ounce as investors sought safe haven assets amid rising geopolitical uncertainty and persistent concerns about the dollar. These dynamics pushed demand for exchange-traded funds (ETFs) for gold to record highs, alongside still-robust central bank purchases. Since the onset of the conflict, however, broad-based profit taking across precious metals—amid upward revisions to interest rate expectations and a stronger dollar—has triggered a sharp correction, bringing gold prices back to their levels at the start of the year. At the same time, supply disruptions have led the increase in the price of base metals. Copper prices surged 29.5 percent following mining accidents in Chile and Indonesia, while aluminum increased 29.8 percent following the shutdown of smelters in Iceland, Mozambique, and the Middle East (which accounts for roughly 9 percent of global aluminum production). Futures markets for base metals suggest further price increases in 2026, indicating resilient demand amid still-fragile supply.

Rising food prices outweighed falling beverage prices, lifting the IMF's food and beverages price index by 4.7 percent between August 2025 and March 2026. Beverage prices plunged by 24.8 percent, led by a 57.4 percent drop in cocoa prices as favorable weather in West Africa boosted supply and inventories while global demand softened. Coffee prices fell by 9.9 percent following a record Brazilian harvest and improving supply conditions in Vietnam. In contrast to beverage prices, food prices are expected to increase by 6.0 percent in 2026. Cereal prices rebounded from historical lows in the first quarter of 2026 owing to growing weather concerns in key producing regions, while futures prices suggest that higher fuel prices are expected to boost demand for biofuel feedstocks such as soybean oil. Should the conflict linger on, higher transport and gas-derived fertilizer prices, together with higher demand for biofuel feedstocks, could drive food prices much higher—particularly those for cereals.

Figure 1.SF.1. Commodity Market Developments



1. Commodity Prices
(Index, 2016 = 100, US CPI adjusted)



2. Brent Crude Oil Price Forecasts
(US dollars per barrel)

Sources: Bloomberg Finance L.P.; Haver Analytics; IMF, Primary Commodity Price System; International Energy Agency; and IMF staff calculations.

Note: In panel 2, expiration dates are on the *x*-axis. CPI = consumer price index; WEO = *World Economic Outlook*.

The Economics of Rare Earths: Global Impact of Shortages and Industrial Policy

Motivation

Since 2020, successive waves of trade restrictions imposed by all major economic blocs have harmed international cooperation and growth. In April 2025, shortly after the US imposed sizable tariffs on most of its trading partners, China—the world's top producer of rare earth elements (REEs)—introduced export licensing requirements for seven REEs and REE-based permanent magnets, causing temporary but serious supply disruptions for manufacturers worldwide.

Like other hard-to-substitute inputs in high-technology manufacturing, produced through geographically concentrated supply chains, REE supply chains are structurally vulnerable. Tensions around these critical inputs have heightened economic security concerns and accelerated efforts to reshore and diversify imports of REE production.

As manufacturing regains strategic importance, understanding the economics of rare earths has become increasingly urgent. This Special Feature addresses two questions: (1) *What would be the macroeconomic impact of a major REE supply disruption across sectors and countries?* and (2) *What would it cost to sufficiently de-risk the REE supply chain over the next decade?*

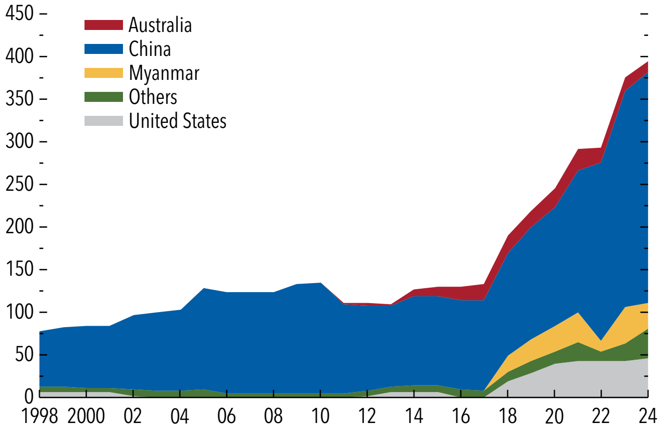
Foundations: Rare Earths Market Structure

REEs are a group of 17 chemically similar metals, typically divided into two categories based on atomic weight: *light rare earth elements* (LREEs) and *heavy rare earth elements* (HREEs), substantially less abundant in the earth's crust than LREEs. REEs possess unique chemical and physical properties—including exceptional magnetism and catalytic enhancement—that make them valuable inputs across electronic, magnetic, optical, and catalytic applications. They are used in small quantities and are essential for automotive manufacturing (especially electric vehicles), renewable energy, oil refineries, defense systems, semiconductors, and consumer electronics. Arguably the single most important application for rare earths is *permanent magnets*—invented in 1983 by General Motors—in which as many as four REEs are combined with iron and boron to create a highly magnetic alloy that maintains its properties at elevated temperatures. These permanent magnets convert electricity into motion (or vice versa), making them central to both the clean energy transition and advanced manufacturing.

REEs constitute a relatively small commodity market, with rare earth oxides (REOs) valued at about $6 billion and permanent magnets at approximately $25 billion in 2024 (Market Data Forecast 2025). As such, the economics of rare earths are increasingly driven by just 4 of the 17 elements: the LREEs neodymium and praseodymium and the HREEs terbium and dysprosium. These "magnet-4" elements jointly comprise 96 percent of the total REO[1] market value despite representing only 23 percent of REO production by weight.[2]

Figure 1.SF.2. Rare Earth Mining by Country 1998–2024

(Thousands of metric tons per year, in TREO equivalents)



Sources: Nassar and others 2023; National Minerals Information Center, US Geological Survey, "Rare Earths Statistics and Information"; and IMF staff calculations.

Note: TREO = total rare earth oxide.

The rare earth supply chain involves multiple specialized stages: mining, concentration, separation of chemically similar elements through solvent-based extraction, and refining to metals or alloys. The resulting metals or alloys then serve as inputs for downstream manufacturers, including permanent magnet producers. The separation stage is particularly technically demanding, requiring hundreds of sequential processing steps, and it is also a pollution-intensive process. Establishing new capacity for *separation* and *refining*—the main stages of REE processing—requires billions in capital investment, years of regulatory approval, and specialized technical expertise, making rapid diversification of processing capacity extremely difficult.

Technical expertise acquired over decades, established infrastructure, differences in environmental and labor regulations, and subsidies made China the dominant world producer of REEs during the 2000s. Today, China's dominance varies significantly by rare earth type and supply chain stage. In regard to LREEs, diversification in mining reduced China's share of global output from 97 percent at its peak in 2010 to 58 percent in 2024 (Figure 1.SF.2), but China maintains 88 percent of the world's oxide separation capacity and 93 percent of its metal refining. With respect to HREEs, China retains a near monopoly across the entire global supply chain: 98 percent of mining (including mining out of Myanmar; Figure 1.SF.3, panel 2), 97 percent of oxide separation, 95 percent of

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[1] "Total REO" represents the sum of all individual rare earth oxides (REOs) contained in mined material. It provides a consistent measure for comparing rare earth output across mines, deposits, and countries.

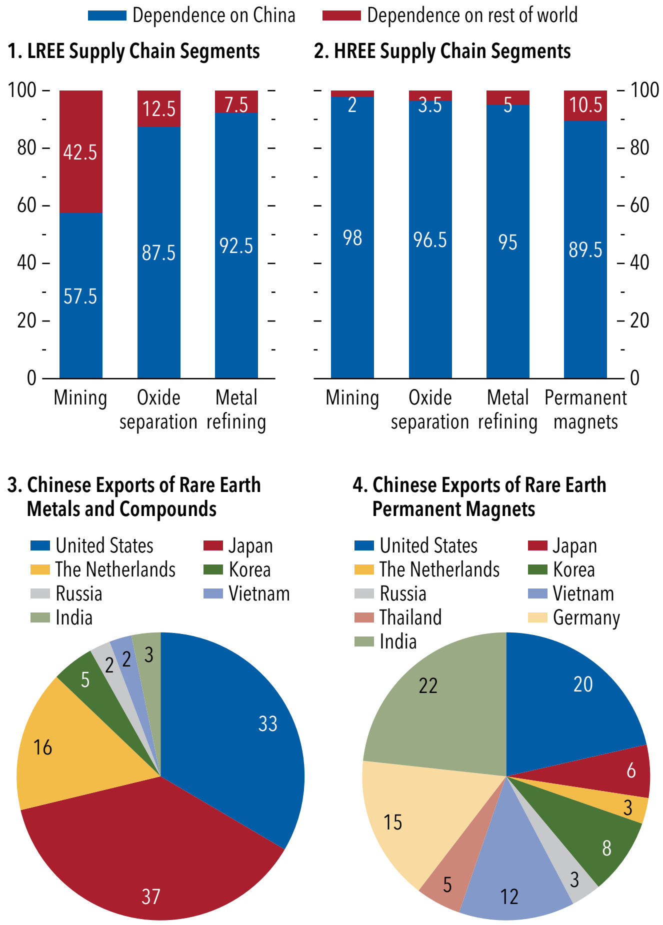
[2] This extreme value concentration reflects both strong demand for permanent magnets—the largest and fastest-growing application, consuming 83 percent of the value of all REOs—and the natural composition of rare earth deposits, which yield lower-demand elements like lanthanum and cerium in far greater proportions than the higher-demand magnet elements neodymium, praseodymium, terbium, and dysprosium.

metal refining, and 90 percent of permanent magnet production (Bedford 2025).[3]

This concentration creates potential *choke points* in the supply chain.[4] While the geographic concentration in HREE mining constitutes an important potential choke point, the *separation* and *refining* stages constitute the most binding bottlenecks, as nearly all rare earth concentrates, regardless of origin, flow through Chinese processing facilities. Permanent magnet manufacturing represents yet another stage in the supply chain in which China holds a dominant market share (90 percent). However, this segment faces lower barriers to capacity expansion: Multiple established magnet producers already operate in Japan, the United States, and Europe, though typically at a smaller scale than in China (Figure 1.SF.3).[5] In many applications REEs are not truly irreplaceable: Substitutes often exist but come with penalties in terms of efficiency, weight, size, or cost. Research suggests that the possibilities of substituting for HREEs are significantly weaker than those of substituting for the average element, with HREEs scoring 78 out of 100 on a substitutability index (on which 100 indicates no adequate substitute exists), compared with 57 for non-REEs (Graedel and others 2015). While certain rare earths have no substitutes, others may be partially replaced by inferior alternatives given enough time and resources.

Figure 1.SF.3. Average Import Dependence on China by Rare Earth Supply Chain Segment

(Percent)



Sources: Bedford 2025; World Bank, World Integrated Trade Solution (WITS); and IMF staff calculations.

Note: Data for panels 1 and 2 are based 2023–24 production, synthesized in Bedford (2025). Data for panels 3 and 4 are from 2024 from WITS. HREE = heavy rare earth element; LREE = light rare earth element.

Macroeconomic Impact of Supply Disruptions

Following a special licensing requirement introduced by China—mainly for HREEs and related products, including permanent magnets—on April 4, 2025, there was a sharp global slowdown in permanent magnet exports between April and June. Exports of these magnets had fallen about 70 percent year over year as of May 2025, indicating a system-wide disruption that extended beyond formally controlled products, but proved short-lived, with monthly Chinese export volumes quickly returning to their positive trend and displaying double-digit year-over-year growth rates (Figure 1.SF.4). In October 2025, China announced further tightening of its REE licensing requirements, which were later suspended in November under a China-US agreement. In January 2026, China restricted HREE exports to Japan. Despite these developments, strong REE export growth continued in January and February 2026. Policymakers in import-dependent countries grew increasingly concerned about the macroeconomic consequences of

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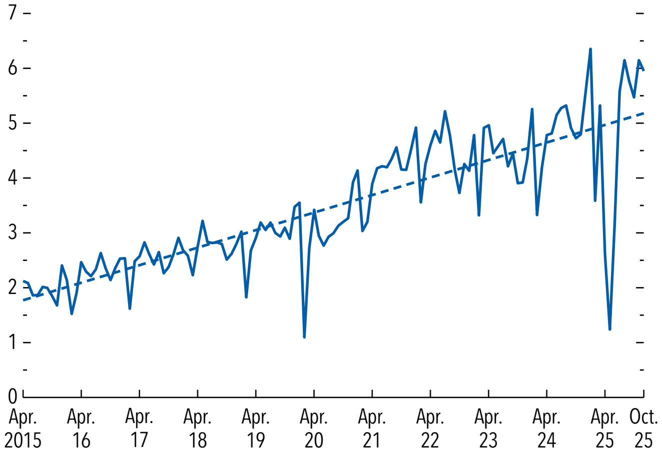
[3] By industry convention, Myanmar's heavy rare earth element (HREE) mining output is often consolidated with China's, reflecting the integration of the two countries' rare earth sectors through upstream investment and downstream processing links.

[4] A choke point emerges when three conditions align: extreme geographic concentration in a single country, potential for disruption, and barriers to rapid diversification.

[5] With China's consumption of REEs, which amounts to 50–60 percent of its production, taken into account, China's market domination is somewhat less apparent. This is especially the case in regard to light rare earth element (LREE) mining, of which China absorbs most of its production at home. For all other supply chain stages, however, dependence on China remains high (74–96 percent of total imports are sourced in China). See Online Annex 1.1, Part I. All online annexes are available at www.imf.org/en/Publications/WEO.

Figure 1.SF.4. China's Exports of Rare Earth Permanent Magnets and Rare Earth Magnet Components Intended for Permanent Magnet Production

(Thousands of metric tons; dashed = trend)

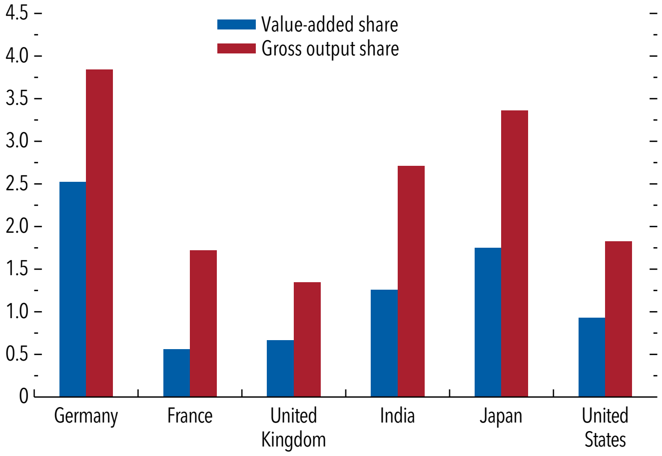


Sources: General Administration of Customs of the People's Republic of China (GACC); Hong Kong Trade Development Council, China Customs Statistics; and IMF staff calculations.

Note: Data are from the series "CN: Export: HS 8: Permanent Magnets or Articles Going to Be Permanent Magnets, of Rare-Earth Metals," Code HS 850511.

Figure 1.SF.5. Value Added and Gross Output at Risk

(Percent of goods and services using rare earth elements as inputs)



Sources: Organisation for Economic Co-operation and Development (OECD), Input-Output Tables; Nassar and others 2025; and IMF staff calculations.

Note: Calculations are based on Nassar and others (2025), which provides industry-specific measures of gross output dependence on rare earths at the Bureau of Economic Analysis 405 × 405 detailed input-output level. These dependence measures are first mapped onto the US input-output structure and then translated to the OECD industry classification input-output with 50 sectors from 2017. Using the OECD input-output framework, country-specific shares of rare-earth-dependent consumption are derived for each OECD-level industry across countries. The value-added share is computed as the value added attributable to rare-earth-dependent activities divided by total GDP. The gross output share is defined as an economy's gross output dependent on rare earths divided by its total gross output.

potential supply disruptions. Notwithstanding REEs' relatively small market size, their use unlocks trillions of dollars in downstream value creation across sectors globally.

IMF staff analysis of US Geological Survey data shows that rare earths are used as inputs in 34 of the 405 sectors of the US economy (Nassar and others 2025). These sectors jointly added $233 billion in goods and services value in 2017, equivalent to 0.8 percent of nominal GDP. The estimated share of value added dependent on rare earths is similarly substantial in other advanced economies and major emerging markets: France (0.4 percent), Germany (2.5 percent), India (1.3 percent), Japan (1.7 percent), and the United Kingdom (0.6 percent). These estimates show that REE exposure varies substantially across countries, with the variance driven by differences in sectoral composition and the relative importance of REE-intensive industries such as automotive manufacturing, renewable energy, and electronics manufacturing (Figure 1.SF.5).

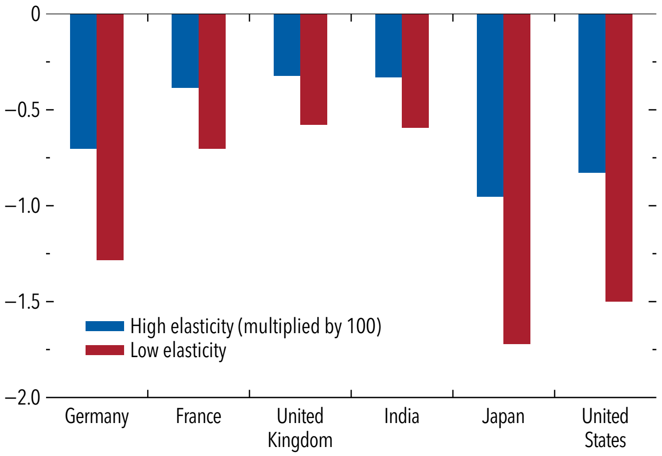
This "value added at risk" (VAAR) measure provides a useful first-pass estimate of possible GDP losses from a hypothetical prolonged and severe REE supply disruption. The VAAR measure also reveals the macroeconomic importance of rare earth permanent magnets: In the United States, they drive about 70 percent of VAAR.

But the VAAR measure omits important adjustment mechanisms. It likely *overstates* losses by assuming that REEs and magnets cannot be substituted for at all but also *understates* losses by abstracting from cascading input-output (I-O) effects. To quantify potential GDP losses from REE supply disruptions, it is essential to account for both substitutability of other things for REEs and intersectoral linkages between industries directly affected by REE shortages and those that depend on them. For example, if permanent magnets were to become unavailable, electric-vehicle production would be disrupted, with knock-on effects that could ultimately raise transportation costs and ripple through the production of other goods and services. The impact would be larger in industries in which there are no available substitutes for REEs.

To that effect, this Special Feature develops and calibrates a small open economy model with network linkages (Silva and others 2024, extended to incorporate imported REE supply constraints; see Online Annex 1.1, Part II, for more details). The model

Figure 1.SF.6. Output Losses by Country from a Major REE Disruption

(Percent of GDP)



Sources: Organisation for Economic Co-operation and Development; and IMF staff calculations.

Note: The scenarios are based on an 80 percent supply disruption affecting 80 percent of imported goods, specifically rare earths and magnets. The high-elasticity scenario uses a substitution elasticity of 0.8 between the imported goods and their varieties as in Alfaro and others (2025), while the low-elasticity scenario uses an elasticity of 0.015. REE = rare earth element.

analyzes an REE supply shock affecting REE-using sectors—including indirectly through I-O linkages—with implications for prices, real wages, and net foreign assets.[6] The calibration relies on an REE-augmented I-O table based on US Geological Survey data and is applied to a set of major REE-dependent economies. For each country, the analysis considers a persistent 80 percent reduction in all rare earth inputs—oxides, metals, compounds, and magnets—consistent with the average single-supplier import concentration of each of the advanced economies.

Model simulations show how the magnitude of the supply disruption strongly depends on substitution possibilities. When firms have limited scope to replace rare earths, which is the base case for short horizons of less than a year (Nassar and others 2025), GDP losses may exceed those predicted by the VAAR measure (Figure 1.SF.6). Network amplification means that GDP declines by 1.5 percent in the United States, a number almost twice as large as the VAAR measure. By contrast, GDP declines by about 1.2 percent in Germany (with a VAAR measure score of 2.5 percent). This difference reflects the stronger forward linkages of US REE-intensive sectors relative to those in Germany, particularly those in motor vehicles, electrical equipment, and computers and electronics. When the substitution elasticity is set higher, reflecting greater opportunities for producers to adjust (typically for horizons longer than five years, similar to those in Alfaro and others 2025), estimated GDP losses are negligible, averaging only 0.006 percent.[7]

Coping with Risks of Supply Disruptions

In response to high REE supply concentration, countries and firms are adopting a variety of adaptation strategies. *Stockpiling* provides a short-term buffer against disruptions and may deter coercion, but it does not address underlying structural dependence and may be constrained in practice. *Recycling* holds longer-term promise, but in a rapidly expanding market, it cannot yet serve as a primary supply source. Likewise, the superior performance of permanent magnets makes *large-scale substitution* unlikely in the near term. In this context, *reshoring* and *import diversification* have emerged as the main medium-term responses, despite uncertain viability given the long development timelines for these measures, coordination challenges, and potential shortages of skilled labor.

Following China's introduction of REE export licensing requirements in April 2025, advanced economies accelerated the implementation of industrial policies to reduce reliance on China-centric supply chains. Efforts in this area have focused on three approaches. First, price floors and offtake agreements have been concluded aiming to provide investment certainty in volatile markets, as many REE projects are not commercially viable at current neodymium prices (about $55 per kilogram; see Online Annex Figure 1.1.1). For example, a July 2025 agreement between the US government and US rare earth producer MP Materials included a price protection mechanism akin to a floor for key REE products, and price floors more broadly featured prominently in discussions at high-level Group of Seven (G7) critical minerals meetings. Second, governments have provided direct financial

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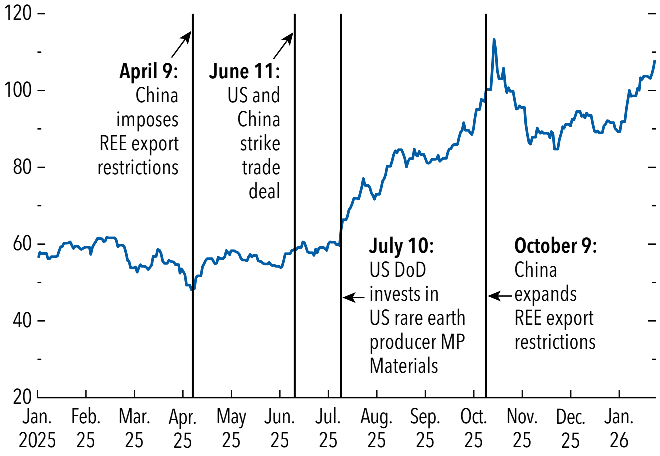
[6] The model features domestic general equilibrium adjustment, assuming a common shock across countries, and limits exports to commodity sectors. REE-intensive sectors, such as motor vehicles, are thus assumed to be fully domestic.

[7] Alfaro and others (2025) estimate industry-specific substitution elasticities between REEs and labor using cross-industry responses to the 2010 REE shock observed over the postshock period 2011–18. Their estimates range from 0.8 to 1.4, reflecting medium-term, innovation-inclusive adjustment.

Figure 1.SF.7. Aggregate Stock Market Value of Publicly Listed Firms in the Rare Earth Industry

(Billions of US dollars)



Sources: S&P Global; S&P Capital IQ Pro; and IMF staff calculations.

Note: Firms are identified using Capital IQ based on keyword searches for rare-earth-related terms in business and long business descriptions. The sample is restricted to operating, publicly listed companies with primary locations outside China. This initial screen yields 315 firms. Each firm is manually reviewed to retain only those with active involvement in rare earth extraction, processing, or project development. Firms with only peripheral references to rare earths are excluded, resulting in a final sample of 89 companies. DoD = US Department of Defense; REE = rare earth element; S&P = Standard and Poor's.

support—through equity stakes, loans, and grants—to supply capital and signal long-term commitment.[8] Third, agreements—signed in October 2025 between the United States and Australia, Japan, Malaysia, and Thailand—alongside the G7 Critical Minerals Action Plan promote joint financing and coordinated procurement, mobilizing an estimated $6.4 billion in public and private funding to de-risk REE supply chains. These measures have been effective in improving the financial prospects of publicly listed firms in the industry (Figure 1.SF.7).

Quantifying the Impact of Industrial Policies to De-risk Rare Earth Supply Chains

Because reshoring is costly, policymakers should balance *efficiency losses* from reshoring in normal times against *expected disruption losses* in times of crisis. Optimal de-risking is better viewed as an insurance policy in which the cost of the premium to be paid in normal times (efficiency losses) should be commensurate with the damage expected in crisis times (disruption losses).[9] Given these considerations, policymakers usually emphasize de-risking rather than decoupling. It should be noted that similar considerations also play a role for other goods and commodities, including energy, food, fertilizers, and semiconductors.

To analyze alternative industrial policies, a calibrated dynamic trade model of the global rare earths market has been developed for this Special Feature. The model features producers in different countries that invest in both extraction and processing capacity to produce raw and processed REEs. The model calibration draws on detailed market, industry, and geological data (see Online Annex 1.1, Part III, for details).

The model is used to assess the effects of two industrial policies—*investment subsidies* and *price floors*—applied to oxide separation (the most crucial processing stage) under two hypothetical implementation scenarios: either *unilaterally*—in the example here by US-based producers—or through *simultaneous* action among all importer countries.[10] To illustrate the economic trade-offs, policy instruments are calibrated to achieve *25 percent self-sufficiency in rare earth processing by 2035 in the US.*[11] This is 15 percentage points higher than the comparable figure in the baseline (with unchanged policies) and in line with International Energy Agency projections (IEA 2025).[12] The same benchmark is used in the case of *simultaneous* action in order to highlight the fiscal cost implications of de-risking by various countries instead of unilaterally.

The analysis allows a certain number of conclusions to be drawn (Figure 1.SF.8). First, sizable interventions would be needed to attain the 25 percent self-sufficiency target; for example, in the unilateral scenario, the investment subsidy must cover 77.2 percent of total investment costs for the US to

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[8] The July 2025 MP Materials deal included substantial equity and loan components, and the January 2026 agreement between the US Department of Commerce and USA Rare Earth similarly combines government equity, below-market lending, and direct federal funding (grants) to support domestic capacity expansion.

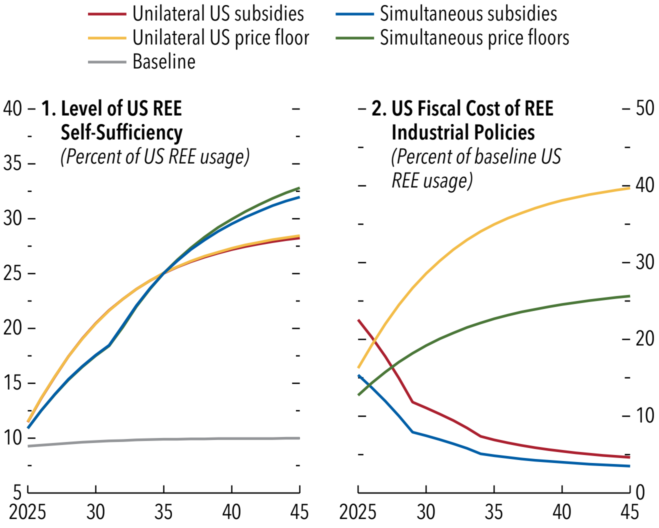
[9] Moreover, security benefits may exhibit diminishing returns, with the first 10–20 percent increase in self-sufficiency delivering the largest reduction in vulnerability. This means that modest self-sufficiency rates can substantially reduce vulnerability to supply disruptions at minimal efficiency costs (Clayton, Maggiori, and Schreger 2024).

[10] Price floors are currently being discussed among Group of Seven policymakers, while investment subsidies proxy for a broad class of capital expenditure support measures used in practice, including grants and below-market lending.

[11] US self-sufficiency is defined here as the share of domestic rare earth consumption supplied either by domestic production or by imports from countries other than China (through friend-shoring).

[12] See Online Annex 1.1, Part III, for an analysis of a more ambitious 50 percent self-sufficiency target.

Figure 1.SF.8. Effectiveness and Fiscal Cost of Alternative Industrial Policies to Achieve 25 Percent REE Self-Sufficiency in the US



Source: IMF staff calculations.

Note: Investment subsidy to US refiners only implemented with a 77.2 percent subsidy; investment subsidy to refiners outside China only implemented with a 77.8 percent subsidy; price floor subsidy to US refiners only implemented with a price floor 2.42 times the period market price; price floor subsidy to refiners outside China implemented with a price floor 2.2 times the period market price. Baseline scenario assumes 4.7 percent global demand growth in 2025–29, 1.42 percent global demand growth in 2030–34. REE = rare earth element.

reach 25 percent self-sufficiency by 2035. The required policy intervention is also sizable under a price floor: 2.4 times the period market price for the unilateral scenario. These large policy interventions reflect the relative efficiency of Chinese producers but also point to important price effects. Because there are already large capacities in both mining and refining of REEs, boosting production in a well-supplied market depresses prices and profits, which reduces private investment incentives and, all else equal, requires more generous government interventions to induce development of additional capacity.

Second, investment subsidies are typically more fiscally efficient than price floors when evaluated in present-value terms. This reflects the fact that investment subsidies are targeted at new capacity, whereas price floors also generate windfall gains for incumbent producers by supporting existing production. As a result, for a given self-sufficiency target, the net present value of subsidy payments is lower than that of price floor interventions. To achieve the 25 percent target under the unilateral scenario, US fiscal costs associated with the investment subsidy over the first decade amount to 141 percent of the annual US market size—equivalent to about $1.19 billion ($0.81 billion).[13] At the same time, investment subsidies are more costly in the short term (Figure 1.SF.8, panel 2) than price floors as they front-load fiscal outlays, with costs declining in the long term once investment is largely limited to replacing depreciated capital.

Third, *simultaneous* action reduces the fiscal cost of achieving a given self-sufficiency target. For example, when all importing economies incentivize investment in refining, US self-sufficiency is achieved through a less concentrated buildup of capacity, as part of the fiscal cost is outsourced to the incentivizing economies. Under *simultaneous* action, those economies can also leverage the higher US efficiency in REE processing and experience substantial gains in self-sufficiency, at comparatively lower fiscal costs.[14]

Conclusion

This Special Feature shows that large disruptions to REE supplies could substantially reduce GDP in many economies, particularly in the short term when substitution options are limited. Avoiding trade tensions and restrictions remains the first-best outcome to promote steady REE supply. Model-based analysis suggests that de-risking supply chains through targeted industrial policies is fiscally costly. Costs are lower if de-risking is pursued by various importers simultaneously and if policy instruments directly target the expansion of new production capacity. IMF research also suggests that industrial policies should be used cautiously (Baquie and others 2025). Beyond industrial policy, governments can promote complementary structural reforms that would lower barriers to entry into REE markets through simpler mining permits, investment in the specialized skills the sector requires—from separation chemistry to metallurgy—and competitive allocation of subsidies.

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[13] Global REEs' market size is about $6 billion. The US share is 14 percent, so roughly $0.81 billion.

[14] See Bogmans, Cuadros Bloch, and others (forthcoming) for more analysis.