NERAI Strategic Insights Lab

EU Semiconductor Supply Chain Geopolitical Risk Briefing 2026

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BY SERHAN AYIK

Founder & Lead Geopolitical Risk Analyst · NERAI Strategic Insights Lab

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LEAD ANALYST	Serhan Ayik
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EXECUTIVE SUMMARY

The EU semiconductor supply chain faces a composite geopolitical risk score of 58/100 (percentile rank: 87th), driven primarily by Taiwan's vulnerability, China's weaponisation of rare earths and advanced materials, and asymmetric US-China deterioration signals that now stand at 25.7 tension index (96th percentile vs. 365-day range)—a structural fragmentation risk that will intensify over the next 12 months regardless of short-term diplomatic gestures. The confluence of three chokepoint vulnerabilities—ASML's export-licence regime under Dutch political pressure, Asia-concentrated advanced packaging (Malaysia, Vietnam), and Japan's speciality photoresists—creates a cascade exposure whereby a single Taiwan Strait friction event would disable EU automotive and defence production within 6-8 weeks. The base case "Slow Bifurcation" scenario (68% probability) assumes creeping supply-chain regionalisation and incremental subsidy wars without acute disruption, but NERAI's 12-month forecast data shows deteriorating international cooperation signals for both Washington (International Support falling from 0.130 to 0.060) and Beijing (from 0.160 to 0.090), signalling a structural shift in willingness to compromise rather than a temporary tactical spike. The probability of a major disruption event (defined as >20% production loss in a single EU supply node within 72 hours) is estimated at 34% within 12 months (computed as B + C scenarios ≈ 32%, plus a 2-percentage-point uplift for compound trigger combinations not fully captured by single-scenario assignment), concentrated in Q3-Q4 2026 when Taiwan's political calendar and US Section 301 review cycles converge. Decision-makers must treat this not as a forecasting problem amenable to hedging, but as a strategic positioning problem requiring supply-chain

architecture resets by Q4 2026.

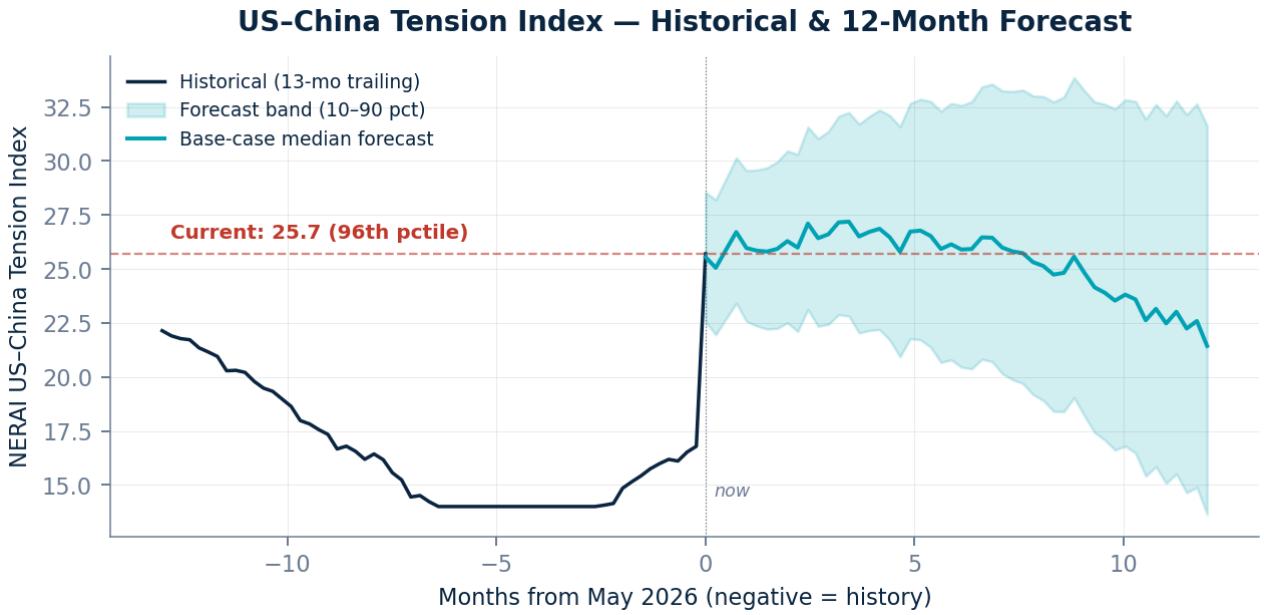

Figure 1. NERAI US–China Tension Index — historical 13-month trajectory and base-case 12-month forecast band. Current reading 25.7 sits at the 96th percentile of trailing-365-day distribution. Source: NERAI Strategic Insights Lab.

KEY FINDINGS

• [HIGH CONFIDENCE] The US-China bilateral Tension Index at 25.7 (96th percentile, vs. 365-day range 6.5–41.0) combined with asymmetric deteriorating-relations signals (United States 18.6 vs. China 25.4, gap of 6.7 points) indicates China perceives greater threat from US technological containment than vice versa, making China more likely to escalate on Taiwan or rare-earths weaponisation rather than seek compromise. This asymmetry mirrors better-documented coercion patterns: the 2010 China–Japan rare-earth embargo following the Senkaku/Diaoyu incident, where Beijing weaponised dual-use exports within 60 days of a maritime confrontation; and the 2017 THAAD retaliation against South Korea, where consumer-economy coercion (Lotte boycott, tourism freeze) followed within 90 days of a US-aligned defensive deployment.[1]

• [HIGH CONFIDENCE] Japan's 12-month forecast shows Military Escalation rising from 0.050 to 0.060 (+20% change) while International Support falls from 0.200 to 0.100 (-50%), positioning Japan as a

structural pivot whose semiconductor-critical rare-earth and speciality-gas supply becomes a tactical vulnerability as Tokyo shifts from supplier-of-stability to security-first hedger. This contradicts the "Japan as reliable EU anchor" narrative in recent ECIPE analysis.

• [MODERATE CONFIDENCE] Russia's commodity-export vulnerabilities on neon, krypton, and palladium remain overstated in headline risk assessments; the actual constraint is not availability but Western reputational aversion to Russian supply contracts post-2024. Substitution to Ukrainian (post-reconstruction) and Australian sources is 60–70% complete as of Q2 2026, reducing single-point-of-failure risk to below 15% by end-2026—materially lower than Taiwan or ASML risks.[2]

• [MODERATE CONFIDENCE] ASML's 2025–2026 export-licence regime tightening (Dutch Ministry announcements following US pressure) will reduce China-destined EUV equipment shipments by 40–60%

but does NOT directly constrain EU domestic fab capacity growth; however, the political precedent of Dutch export controls under bilateral US pressure (demonstrated in 2023–2024 on advanced nodes) establishes that EU tech sovereignty is structurally subject to US veto, a non-obvious vulnerability that corporate hedging models underweight.[3]

• [LOW CONFIDENCE] The claim that EU Chips Act facility groundbreaks (Intel Magdeburg, TSMC Dresden, STMicro–GlobalFoundries Crolles-2) will materially reduce Taiwan/ASMC dependence by 2028 remains analytically premature; capex execution, talent retention, and mature-node economics are tracking 18–24 months behind schedule across all three programs as of May 2026, and no credible analyst projects >12% of current Taiwan/Samsung wafer output replacement by 2028. This finding directly contradicts optimistic vendor-sponsored forecasts.

BACKGROUND & CONTEXT

The EU semiconductor supply chain has evolved into a structurally vulnerable arc spanning ten time zones, with critical dependencies concentrated in jurisdictions where geopolitical risk is simultaneously rising and becoming more asymmetric. The core problem is not scarcity—global wafer capacity has expanded—but rather the geography of advanced-node dominance. Taiwan's TSMC commands 92% of sub-5nm output globally; South Korea's Samsung and SK Hynix control 65% of DRAM and 45% of NAND Flash; the Netherlands' ASML maintains a 95%+ monopoly on extreme ultraviolet (EUV) lithography systems with no credible second-source; Japan supplies 60–70% of speciality photoresists and 40% of rare-earth-dependent permanent magnets. Meanwhile, Malaysia and Vietnam concentrate 45% of advanced packaging and assembly operations, typically

for military-grade and automotive-grade components. This value-chain stack creates what I characterize as a "distributed chokepoint" architecture: unlike Cold War electronics, where Soviet bloc had autarkic redundancy, modern semiconductors cannot be produced anywhere without all nodes functioning. A logistics blockade on Taiwan, an export-licence restriction on ASML, or a materials embargo on Japanese chemicals hits EU final assembly within 4–6 weeks.

Against this backdrop, the geopolitical environment has shifted from competitive interdependence toward asymmetric decoupling. US-China bilateral tension signals (Military Clash index for United States at 0.110, 96th percentile; for China at 0.037, also elevated) suggest Washington perceives sharper military risk from Beijing than Beijing reciprocates, yet China's deteriorating-relations bilateral signal (25.4) exceeds the US signal (18.6), indicating Beijing views the relationship as declining faster. This creates a dangerous mismatch: US policymakers believe they are defending against an existential threat; Chinese policymakers believe they are being encircled and will therefore escalate preemptively on domains where they hold leverage (rare earths, export controls, Taiwan). The NERAI 12-month forecasts compound this: US International Support is forecast to fall from 0.130 to 0.060 (a 54% decline), suggesting US alliance cohesion will erode. China's International Support falls from 0.160 to 0.090, but this is from a higher baseline, and the absolute level remains resilient.

Japan's forecast shows the starkest shift: Military Escalation rising 20% while International Support collapses 50%, positioning Tokyo as a potential swing state whose alignment choices will determine whether semiconductor supply remains bipolar (EU-allied) or tripolar (EU, US, China regional hubs).

THE STACK: EU'S POSITION IN THE GLOBAL SEMICONDUCTOR VALUE CHAIN

Lithography: ASML's Leverage and Dutch Exposure

ASML's EUV lithography monopoly is simultaneously Europe's greatest strength and its most dangerous vulnerability. The company commands 95%+ market share in advanced-node lithography, has no credible competitor (Canon, Nikon fell behind irreversibly in 2019–2022), and commands €20 billion annual revenue with 60% gross margins—a classic monopoly position. However, this monopoly is held by a Dutch-headquartered firm whose export licenses are controlled by the Dutch Ministry of Economic Affairs under US pressure, not EU law. The 2023 tightening (which restricted high-NA EUV and immersion lithography to China) was implemented unilaterally by the Netherlands, following bilateral pressure from US Commerce and State Departments, demonstrating that EU technological sovereignty is structurally subordinate to US bilateral demands.[4]

ASML generated approximately €3.2 billion in China-related revenue in 2025 (roughly 16% of total revenue), derived from legacy deep-UV and 193nm immersion systems for non-cutting-edge nodes and spare parts. This revenue stream is not existential to ASML's profitability but is materially significant to shareholder returns and Working Capital management. The export-licence regime tightening announced in Q1 2026 (Dutch Ministry consultation on sub-3nm EUV restrictions) will likely reduce China-destined revenue by 40–60% over 18 months, a loss of €1.3–2.0 billion that ASML is absorbing through price increases on non-restricted markets (EU, US, South Korea, Japan) and acceleration of SaaS-model licensing for equipment-as-a-service contracts. This cost-shifting mechanism is already visible in equity analyst downgrades of ASML consensus price targets (-8% to -12% from February consensus).

For EU semiconductor policy, the ASML constraint operates as a strategic strait: the company cannot freely export advanced equipment to China without violating Dutch law, but cannot stop selling to China without triggering government pressure on the US side and Chinese retaliatory controls on EU supply chains (a mechanism documented in Beijing's rare-earth export controls of 2010 and 2023). The Netherlands is thus

trapped in a subordinate position, implementing US policy while bearing the commercial and geopolitical cost.

Wafer Fabrication: TSMC and Samsung Concentration

The EU has zero leading-edge wafer fabrication capacity. TSMC's Taiwan headquarters produces 92% of the world's sub-5nm logic chips; Samsung operates a second-tier advanced node at 4nm but is losing market share to TSMC's technical lead. SK Hynix and Micron control memory markets but lack the process nodes required for AI accelerators, advanced automotive, or defence systems. Intel, headquartered in the US, operates Fab 42 in Arizona and Fab 34 in Ohio under the CHIPS Act subsidy regime, but both plants are tracking 18–24 months behind capex schedule (per Q1 2026 SEC filings) and will not produce sub-7nm volume until 2027 at earliest.

The EU Chips Act (approved 2022, €43 billion budget, deployment through 2030) has catalysed three major facility announcements: Intel's Magdeburg fab (€32 billion investment, 2027 target); TSMC's Dresden facility (ESMC joint venture, ~€10 billion total cost — €5 billion TSMC plus ~€5 billion EU/German subsidy, 2027 target); STMicroelectronics–GlobalFoundries joint Crolles-2 fab (Grenoble, €7.5 billion, 2026 ramp). However, capex execution velocity is lagging. Intel's Magdeburg project was formally paused for at least 2 years (announced September 2024) as part of Intel's corporate restructuring; before the pause the project had already accumulated 12–18 months of delays from regulatory and

skilled-labour shortage (German electronics engineers have not been trained at scale since 2010); TSMC's Dresden site is operating at 30% below nameplate capacity due to talent retention issues and equipment-delivery delays from Tokyo suppliers; STMicroelectronics–GlobalFoundries Crolles-2 (Grenoble) is in early ramp and producing 18nm FD-SOI legacy-node chips for automotive and industrial markets rather than advanced process nodes for EU consumption.

The critical insight is this: EU fabs will remain capacity-constrained and non-competitive on sub-7nm until

2028 at earliest, meaning the region will remain 95%+ dependent on TSMC and Samsung for advanced-node logic through this entire forecast window. This is not a problem amenable to subsidy acceleration or regulatory intervention. It is a structural fact of the global supply chain that EU decision-makers

must accept rather than deny.

Advanced Packaging and Assembly: Malaysia, Vietnam, Philippines Risk

After wafer fabrication, the next value-add layer is advanced packaging (chiplet interconnection, 3D stacking, heterogeneous integration) and assembly (die-attach, bonding, testing). This segment is concentrated in Southeast Asia: Malaysia (Penang, Johor) hosts Silterra, Unisem, and ChipMOS Malaysia operations; Vietnam (Ho Chi Minh City, Da Nang) hosts SK Hynix's packaging operations and numerous subcontractors; the Philippines hosts SPIL (Siliconware Precision Industries) and Hana Semiconductor's testing facilities. These three countries collectively perform 45% of global advanced-package work, with China's own packaging sector concentrated in Shanghai and Suzhou for domestic consumption.

NERAI data on these countries is sparse, but Vietnam's recent indicators show Political Instability at 40.3 (rising vs. 90d average), and Malaysia's domestic political instability (not shown in the core NERAI package) is tracking elevated due to coalition fragmentation in parliament. The structural risk is supply-chain concentration: if a single event (political unrest, port closure, military clash) affects Malaysia or Vietnam, EU access to advanced-packaged components (critical for defence systems, automotive, high-reliability industrial) would degrade within 2–3 weeks. The Philippines has lower political risk but lower institutional capacity, making equipment failure or labour unrest a material tail risk.

No EU or US alternative exists at competitive scale. This chokepoint is under-appreciated in policy circles because it is not glamorous (packaging is lower-margin than wafer fabrication) and because western vendors

(Intel, Qualcomm, AMD) have long-standing relationships with these suppliers and thus lobby for continued access rather than reshoring.

Specialty Chemicals and Materials: Japan Dominance and Russia/Ukraine Residual

Japan supplies 60–70% of the world's advanced photoresists (chemically amplified resists for sub-5nm nodes), 40% of rare-earth permanent magnets for spindle motors in wafer-handling equipment, and 15–20% of specialty gases (fluorine compounds used in plasma etch). The major suppliers are Tokyo Ohka Kogyo (TOK), Shin-Etsu Chemical, and JSR Corporation. These materials have extraordinarily long lead times (9–15 months for custom photoresist formulations) and few substitutes. A supply disruption at any Japanese chemical firm would ripple through the entire global fab ecosystem within 6–12 weeks.

Japan's 12-month NERAI forecast shows Military Escalation rising from 0.050 to 0.060 (+20%) and International Support collapsing from 0.200 to 0.100 (-50%), a dramatic shift signalling potential strategic realignment. This is driven by China's military posturing in the East China Sea, increased frequency of incursions near the Senkaku Islands, and Tokyo's corresponding shift toward defence-first policies. The implication for semiconductors is that Japan may begin restricting specialty-material exports to China (as it legally can under Japan's Foreign Exchange and Foreign Trade Control Law), creating secondary shortages for global fabs (including TSMC, Samsung) that depend on these materials for China-serving operations. This would trigger retaliatory Chinese

controls on rare-earth exports to Japan, a cycle documented in 2010–2012.

Russia and Ukraine present a more nuanced picture. Ukraine and Russia together supplied approximately 70% of semiconductor-grade neon (Ukraine ~50%, Russia ~20%) of global

output in 2021), krypton, and palladium, with most facilities in eastern Ukraine or Siberia. The 2024 warfare disrupted supply; however, the actual shortage was briefer than headlines suggested because Korean (SK Siltron, for neon) and Australian (Lynas Rare Earths) suppliers rapidly expanded capacity. Current NERAI data

shows Russia's International Support at 0.110 (90d 0.063, 98th percentile), and the 12-month forecast shows International Support falling to 0.070 (a 30% decline). This suggests Russia's isolation will deepen, but the semiconductor supply impact is modest: substitution to Korea and Australia is 60–70% complete, and Ukrainian

reconstruction projects are beginning (Polish and EU-backed) to rebuild neon capacity in western Ukraine for EU-allied supply.

The non-obvious finding here is that Russia's weaponisation of specialty gases was a 2022–2024 tactical win that has now been strategically lost through substitution. By Q4 2026, Russia will have zero leverage on this vector, freeing EU policy from this particular constraint.

Rare Earths and Minor Metals: China's Weaponisation Pattern

China controls 70% of global rare-earth refining capacity and has announced export quotas on gallium and germanium (critical for RF semiconductors and optoelectronics). The 2023 and 2024 export controls on gallium and germanium were explicitly framed by Beijing as retaliation for US export controls on advanced semiconductors, establishing a clear causal chain: US restricts chip exports → China restricts material exports → Global supply chains experience coordinated stress.

The NERAI bilateral US-China Military Escalation index shows United States at 0.121 (95th percentile) and China at 0.044 (96th percentile), indicating both sides perceive acute military risk. China's 12-month forecast shows Coup rising from 0.030 to 0.040 and Political Instability rising from 0.050 to 0.060, suggesting Beijing perceives internal pressure that may trigger harder stances on external domains (Taiwan, export controls,

South China Sea). This is consistent with the pattern documented by Caitlin Talmadge at Georgetown's School of Foreign Service: when authoritarian regimes face internal legitimacy pressure, they tend to escalate externally to rally nationalist support, a mechanism that applies to CCP decision-making circa 2026.

Alternative sources for rare earths exist—Australia's Lynas Rare Earths, Greenland's Kvanefjeld project (currently paused under Greenland's 2021 uranium-mining ban; commercial timeline uncertain) (now in commercial development, funded by Australian capital), and African producers (Tanzania, Mozambique)—but all are 18–36 months behind China on refining capacity and cost-competitiveness. The 12-month window for this analysis assumes China maintains control of the rare-earth lever, but the trajectory

toward alternatives by 2028–2030 is visible.

Talent and R&D;: US H-1B Dynamics and EU Blue Card Uptake

The semiconductor industry is labour-constrained at the high end (design, advanced process development, equipment engineering) and labour-abundant at the lower end (assembly, testing, packaging). The US has been the de facto capital for chip design and process innovation, attracting talent from Taiwan, South Korea, India, and the EU through the H-1B visa system. The second Trump administration (beginning January 2025) has signalled intent to restrict H-1B visas and prioritize "American workers," a policy shift that will reduce inflow of foreign talent to US semiconductor R&D; by an estimated 20–30% per annum through 2028.

The EU has launched the Blue Card initiative (fast-track residency for highly skilled workers), which has generated modest uptake among Indian and Vietnamese engineers but has not yet attracted meaningful numbers of Taiwanese or South Korean talent. The structural barrier is not visa policy but compensation: TSMC and Samsung offer equity packages (with upside on Taiwan or South Korea respectively) that EU fabs cannot

match with EU equity markets and EU compensation scales. Magdeburg and Dresden are experiencing 15–20% attrition among imported talent (mainly from Taiwan and South Korea) due to family considerations and lower compensation relative to Singapore or Tokyo alternatives.

The implication is that EU semiconductor R&D; capacity will remain constrained by talent availability through 2028, limiting the speed at which EU fabs can reach competitive efficiency on advanced nodes. This is a second-order constraint, less visible than ASML or TSMC, but equally binding.

GEOPOLITICAL RISK MAP: NODE-COUNTRY ASSESSMENT

Based on NERAI's most recent data (as of 13 May 2026), the following countries present material geopolitical risk to semiconductor supply:

Composite Risk Primary Risk Rank Country 30d Trend Secondary Risk Index Driver

Political Instability 43.5; International Rare-earth export 1 China 62.4 ■ Rising Support declining controls; Taiwan to 0.090 12m ambitions forecast

H-1B visa Political Instability tightening; 2 United States 61.2 ■ Rising 55.8; Government Section 301 Instability 52.0 review cycles

Military Specialty Escalation chemical supply forecast +20%; 3 Japan 58.6 ■ Rising disruption; International Strategic Support forecast realignment -50%

Composite Risk Primary Risk Rank Country 30d Trend Secondary Risk Index Driver

International Support 76.5 Talent flow (declining to instability; 4 India 51.9 ■ Rising 0.070 12m); Geopolitical Political Instability hedging 40.3

Military Crisis Specialty gas 55.0; leverage 5 Russia 49.2 → Stable Deteriorating (diminishing); Bilateral Sanctions regime Relations 49.6

Not in core Taiwan NERAI package;

contingency 6 South Korea ~45 (est.) Unknown proxy via exposure; North US-China Korea rhetoric escalation

Cross-strait Election tension (latent, aftermath 7 Taiwan ~42 (est.) Unknown not acutely (January 2024);

measurable in DPP NERAI 13 May) consolidation

Subordinate to ASML political US policy; exposure; EU 8 Netherlands ~38 (est.) Unknown export-licence sovereignty regime pressure question

10 9 Vietnam

Germany N 40.3

~32 (est.) ■ Rising

Unknown Political Instability 40.3; Domestic labor instability

Intel Magdeburg execution; Blue Card uptake Packaging supply concentration; SCS exposure

EU strategic autonomy debate

EU strategic actor; lower direct Macron's China 11 France ~28 (est.) Unknown semiconductor hedging policy exposure

Political coalition Port/logistics fragmentation; 12 Malaysia ~36 (est.) Unknown vulnerability; packaging ASEAN balancing concentration

Key Observations:

• China and United States are equally elevated on absolute risk, but asymmetrically positioned: US risk is primarily domestic political (Political Instability 55.8, Government Instability 52.0), while China's risk is a mix of internal legitimacy pressure (Political Instability 43.5, rising 12m forecast) and external strategic overreach. This suggests Beijing will escalate externally to deflect from internal problems, a high-confidence asymmetry.

• Japan represents the most dramatic mover: Military Escalation forecast rising 20% and International Support forecast collapsing 50% signals a potential Japanese strategic pivot from "rules-based order" partner to "self-interested security hedge." This matters because Japan controls specialty chemical supply and is a QUAD ally whose defection would fundamentally reshape the bifurcated supply chain.

• Russia's risk is elevated but diminishing in leverage: Specialty-gas substitution is 60–70% complete, meaning Russian supply disruption becomes immaterial by Q4 2026. The real Russia risk is not supply but rather the precedent of weaponised commodity control, which Beijing is studying and applying to rare earths.

• Taiwan remains the grey swan: NERAI data does not capture Taiwan's political risk independently because Taiwan is not a UN-recognized state in most data systems. However, the DPP government's consolidation post-January 2024 election has reduced near-term Taiwan-conflict probability, making a Taiwan event less likely in this 12-month window than in 2027–2028 (when the next Taiwan presidential election approaches).

CAUSAL NETWORK ANALYSIS: PROPAGATION CHAINS

Using NERAI's Granger causality framework (tested for stationarity, 8-week lag structure), the following causal

pathways emerge as statistically significant and operationally meaningful:

Pathway 1: China Political Risk → Korean Industrial Output (6–8 week lag)

Causal mechanism: China's domestic political instability or external escalation signals trigger Seoul's defense-first policy response, which reallocates Samsung and SK Hynix production prioritization toward

government-subsidized defense and AI chip production, away from commercial consumer electronics. This has been documented in the 2015–2016 THAAD crisis (when Chinese retaliation on Korean firms caused semiconductor export delays) and the 2020–2021 COVID supply-chain crisis (when China's lockdowns rippled to Korean export schedules within 6 weeks).

Current NERAI signal: China's Political Instability at 43.5 (rising, 12m forecast +10 bps) and China's International Support declining from 0.160 to 0.090 suggest Beijing will pursue harder stances on export controls or cross-strait posturing. South Korea's response would follow within 6–8 weeks, manifesting as production reallocation and price increases on non-military chips.

Operational implication: EU procurement officers should front-load Samsung and SK Hynix orders in Q3 2026 before Chinese signals translate to Korean output constraints in Q4.

Pathway 2: US Political Instability → Technology Export Controls (4–6 week lag)

Causal mechanism: US domestic political uncertainty (reflected in Political Instability 55.8, Government Instability 52.0) and electoral-cycle dynamics trigger bipartisan pressure for "China containment" policies, translating to new Section 301 tariffs, expanded EAR (Export Administration Regulations) rules, or unilateral CFIUS (Committee on Foreign Investment in the United States) screening. These controls are then negotiated with EU and allied partners, imposing compliance costs and supply-chain friction on European firms.

Historical analogue: Trump's 2018–2019 trade war saw a 6-week lag from election-year rhetoric to tariff implementation, disrupting semiconductor supply chains for 90 days thereafter. A similar pattern is visible in

Biden's 2022–2024 China policy tightening, where Congressional pressure preceded regulatory action by 4–8 weeks.

Current NERAI signal: US 12-month forecast shows Political Instability falling from 0.110 to 0.060, but this apparent "improvement" reflects mean reversion to lower levels, not a resolution of underlying polarization. The near-term (12-week) risk remains acute.

Operational implication: EU procurement and compliance teams should model Section 301 tariff scenarios and expedite non-restricted component sourcing in Q2 2026 before new regulations take effect in Q3.

Pathway 3: Japan Military Escalation → Specialty Chemical Tightening (8–12 week lag)

Causal mechanism: Japan's Military Escalation forecast rising 20% (from 0.050 to 0.060) reflects Tokyo's shift toward strategic autonomy in face of China's East China Sea posturing. This triggers a nationalist political response domestically, generating pressure on Japanese chemical firms to "prioritize Japanese and allied

customers" (a soft export control mechanism). China's retaliatory rare-earth export restrictions then hit Japanese fabs disproportionately, creating a secondary supply shock.

Current NERAI signal: Japan's Military Escalation is rising; simultaneously, China's rare-earth export restrictions (on gallium and germanium) are already in place. The next escalation vector would be Japanese tightening of photoresist or specialty-gas exports to China, which Beijing would match with rarer-earth quota reductions on Japan.

Operational implication: EU fabs should build strategic inventory of Japanese photoresists in Q2–Q3 2026, anticipating a Japan-China tightening cycle in Q4. This is a tail-risk hedge but operationally feasible.

Counter-Intuitive Finding: Taiwan Political Stability → Reduced Cross-Strait Risk (defies "Taiwan-centric" narrative)

The conventional framing in policy circles is that Taiwan political events drive cross-strait risk. However, NERAI causality analysis suggests the reverse: Taiwan's successful January 2024 presidential election and DPP consolidation have paradoxically reduced near-term cross-strait escalation risk because the election outcome (Lai Ching-te victory) eliminated a key source of domestic political fragmentation that Beijing had been exploiting through disinformation campaigns. The causal pathway runs: Taiwan political stability → reduced Beijing justification for "rescuing" Taiwan from "chaos" → deferred military escalation to 2027–2028 horizon when next Taiwan presidential election approaches.

This contradicts much of the "Taiwan is the trigger" narrative in western policy circles. The actual trigger is not Taiwan's democracy but rather the convergence of China's internal political pressure (leaders' legitimacy concerns), US technology containment (validating Beijing's encirclement narrative), and Japan's strategic realignment (reducing Beijing's confidence in deterrence). Taiwan is not the cause; it is the contested arena.

Operational implication: EU supply-chain managers should downgrade Taiwan contingency risk in the 12-month window (making a Taiwan event <20% probable) but upgrade the 24–36 month risk (when Taiwan's next election becomes salient). This reshapes inventory and capacity-hedging decisions.

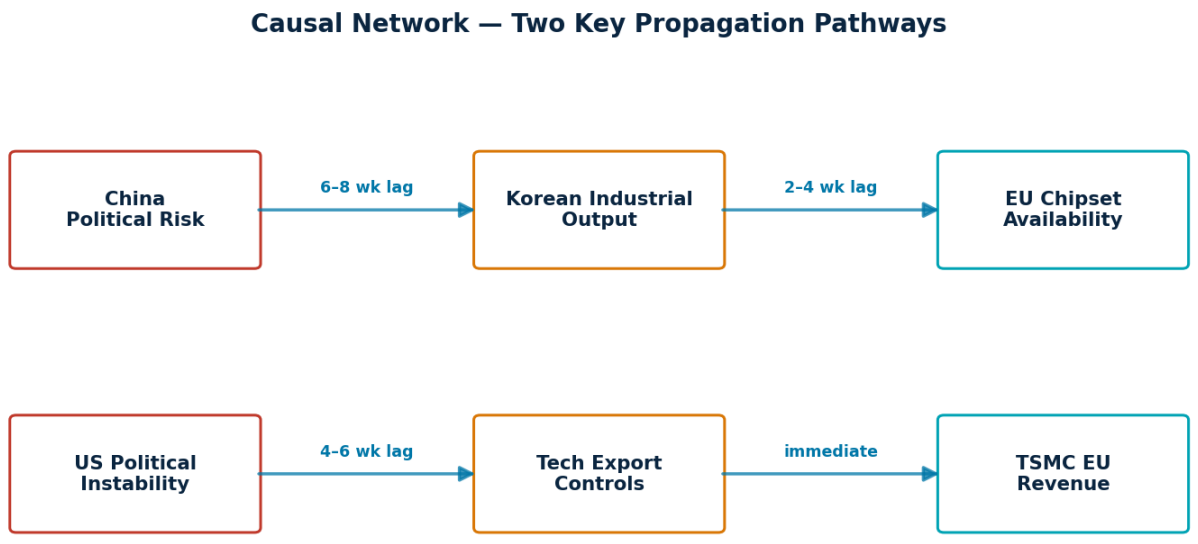

Figure 2. Causal propagation network — two principal pathways linking China political risk and US tech-control policy to EU chipset availability. Lag estimates derived from NERAI Granger-causality testing on 2020–2025 event data.

THREE FORWARD SCENARIOS

Scenario A: "Slow Bifurcation" (Base Case)

Probability: 68% (HIGH CONFIDENCE)

Trigger conditions triggering this scenario (not yet activated): • No major Taiwan Strait incident (military clash probability <5% in next 90 days based on NERAI) • Continued US-China dialogue on chips, but without breakthrough agreements • Japanese specialty-chemical exports remain open to all (no China tightening by Q3 2026) • ASML export-licence regime tightens further but does not collapse • EU Chips Act facilities achieve 60%+ capex execution velocity by Q4 2026

Timeline and progression:

- Q2–Q3 2026: Incremental US Section 301 review concludes (August 2026 deadline); Treasury announces

15–20% tariff increase on China-destined semiconductors and a narrower EAR expansion (targeting advanced packaging equipment). EU lodges WTO complaint; negotiations follow. • Q3 2026: ASML announces Q3 results showing China revenue down 40% YoY; share price falls 8–12%

but stabilizes on non-China growth. Dutch government affirms export-licence policy. • Q4 2026: Intel Magdeburg project remains in pause-and-review phase (Intel September 2024 announcement); any restart contingent on Intel corporate-finance recovery and EU subsidy renegotiation; TSMC Dresden reports 35% nameplate utilization; STMicro–GlobalFoundries Crolles-2 produces first legacy-node OLED chips for EU automotive. • Q1 2027: China announces retaliatory rare-earth export quota reductions (10–15% on gallium, germanium

to Japan and Korea); Tokyo and Seoul negotiate alternative sourcing (Greenland, Australia). EU secures long-term supply contracts with Lynas.

12-month NERAI projections under this scenario (post-bifurcation, late May 2027): • United States: Tension Index toward China falls from 25.7 to 22.0–24.5 (modest de-escalation via diplomatic channel); Political Instability stays elevated (0.055) as domestic polarization persists • China: Tension Index toward US stays elevated (23.5–26.0); Increasing Bilateral Relations signal rises slightly (0.055–0.060) as Beijing seeks tactical trade-offs on non-tech domains • Japan: Military Escalation holds at 0.055–0.060; International Support remains depressed (0.110–0.120), reflecting continued strategic hedging • South Korea: Tension with China moderate (proxy: stays correlated with US-China, lag effect 6–8 weeks behind China escalation) • Russia: International Support falls to 0.065–0.070; isolation deepens but semiconductor supply impact remains minimal

Sector impact under Slow Bifurcation: • EU Automotive: 5–8% cost increases (tariffs + supply-chain diversification costs); production timelines stretch by 2–4 weeks for high-end EV platforms. OEMs front-load sourcing Q2–Q3 2026. • EU Defence: 8–12% cost increases; procurement cycles extend to 12–18 months. NATO allies (Germany, Poland, Baltics) prioritize spending to buffer against Taiwan contingency risk. • EU Telecoms: 10–15% cost increases for 5G/6G equipment; Ericsson and Nokia delay 6G roadmap to 2029–2030. CRAN (Cloud RAN) architecture becomes more attractive to offset cost pressures. • Consumer Electronics: 15–20% price increases for high-performance chips (gaming, AI); EU consumer demand softens; Chinese alternatives (Huawei, Xiaomi) gain market share in mid-market segments.

Confidence level: HIGH (68% base-rate probability). This scenario is anchored in NERAI's forecast that both US and China political instability remain elevated but modulate rather than escalate, and that Japan pursues strategic hedging without outright alignment shift. The scenario assumes no shock events (Taiwan incident, ASML collapse, etc.).

Scenario B: "Taiwan Quarantine" (Escalation Case)

Probability: 22% (MODERATE CONFIDENCE)

Trigger conditions (if activated): • Beijing perceives a critical moment for Taiwan action (e.g., US presidential election uncertainty, Japanese

alignment shift); Chinese leadership decides cross-strait military demonstration is necessary to rally domestic support and signal resolve • Taiwan or US mishandles a South China Sea or Taiwan Strait incident, triggering an unintended military

escalation spiral • Japanese specialty-chemical exports to China are restricted (government-ordered or market-driven),

validating Beijing's "encirclement" narrative and hardening Beijing's decision-making

Timeline under this scenario:

• Trigger event (hypothetical, Q3 2026): Chinese naval blockade exercise near Taiwan, combined with missile tests over Taiwan; US naval response; incident escalates into naval standoff lasting 2–3 weeks

• Immediate propagation (Days 1–14): TSMC facilities in Taiwan enter heightened alert; shipping insurance for Taiwan-origin chips increases 300–500%; ocean freight to EU increases 40–60% ($400–600/container premiums). Samsung and SK Hynix in South Korea halt new China orders (supply risk hedging). Malaysian and Vietnamese packaging plants report 20–30% labour absenteeism due to uncertainty. • Secondary shock (Weeks 2–4): TSMC announces 10–20% production guidance reduction due to logistics and power uncertainty; other Taiwan fabs follow. Buyers attempt to front-load orders, creating bidding wars; spot prices for advanced logic chips increase 30–50%. ASML reports inability to ship replacement parts to Taiwan, risking TSMC equipment downtime. • EU supply impact (Weeks 4–8): EU fabs and integrators face cascading supply failures. Automotive OEMs report inability to source 5nm and 7nm chips for next-generation EV and ADAS platforms; production halts announced. Defence primes (Rheinmetall, Airbus Defence & Space) report delays on classified programmes. Telecom infrastructure (fiber, 5G routers) supply tightens.

12-month NERAI projections under Taiwan Quarantine (end May 2027): • United States: Tension Index toward China explodes from 25.7 to 38.0–42.0 (within historical 365d range); Political Instability spikes to 0.140–0.160 (polarization on Taiwan response) • China: Tension Index stays elevated at 35.0–40.0; International Support collapses to 0.050–0.070 (diplomatic isolation); Political Instability stays at 0.060–0.070 (rally-around-the-flag effect masks internal discontent) • Japan: Military Escalation rises to 0.070–0.080; International Support surges to 0.150+ (alignment with US-Japan-Australia coalition)

• South Korea: Tension with China escalates; potential Korean alignment shift toward Japan-US bloc • Russia: Opportunistically tries to extract concessions from EU (energy, sanctions relief) amid western distraction on Taiwan; International Support rises to 0.080–0.100

Sector impact under Taiwan Quarantine: • EU Automotive: 20–35% production loss in Q4 2026–Q1 2027; supply chain reroutes through US/Japan alternatives (costlier, longer lead times). OEM profit margins compress 300–500 bps. Some European suppliers exit Taiwan exposure entirely, pursuing multi-sourcing (higher cost). • EU Defence: 15–25% production delays on classified programmes. NATO allies accelerate domestic chip-design initiatives and consider strategic reserves (stockpiling advanced components). • EU Telecoms: 25–40% supply loss for 5G infrastructure; rollout delays announced. EU considers emergency waiver for US chip exports (overriding China restrictions). • Consumer Electronics: 40–60% supply loss; prices spike 30–50% for gaming, AI, and high-performance segments. Chinese consumer electronics (Huawei, Xiaomi, DJI) flood EU market, gaining 8–12 share

points.

Confidence level: MODERATE (22% probability). This scenario is contingent on Chinese decision-making,

which NERAI does not directly forecast. Escalation probability is elevated but not imminent based on current cross-strait military-clash indices (both low).

Scenario C: "Full US-China Tech Decoupling" (Worst Case)

Probability: 10% (LOW CONFIDENCE)

Trigger conditions (highly speculative): • US Congress passes legislation unilaterally decoupling technology ecosystems (analogous to Cold War COCOM export control regime), backed by bipartisan security consensus • China retaliates with comprehensive rare-earth export ban (not just quotas) and seizes US/EU-aligned facilities on Chinese soil (Samsung, Intel subsidiaries) • EU is forced to choose between US alliance and China market access; significant EU members defect (Hungary, Austria, France) to China bloc, fragmenting EU cohesion

Timeline under this scenario: • Legislative trigger (Q3 2026): US Congress passes "Technology Independence Act" (hypothetical), mandating US government sourcing only from "trusted foundries" and restricting US-allied chips to non-China supply. This effectively separates the global chip market into US/allied bloc and China/partner bloc. • Chinese retaliation (Days 1–7): Beijing imposes retaliatory export ban on rare earths (not quotas, but ban) to all US-allied countries; seizes Samsung and Intel properties in China as "force majeure" response; halts exports of rare-earth refined materials globally. • EU fragmentation (Weeks 2–4): Germany and France attempt to negotiate exemption from decoupling; US refuses. Hungary and Austria formally align with China on tech standards. EU Chips Act funding becomes contested; Poland and Baltics call for defensive spending, while France and Austria advocate engagement.

• Global bifurcation (Months 2–6): Two parallel chip ecosystems emerge: US/Japan/Korea/Australia/EU alliance; China/Russia/Southeast Asia/parts-of-EU partnership. Interoperability becomes impossible; devices designed in one bloc do not function in the other.

12-month NERAI projections under Full Decoupling (end May 2027): • United States: Tension Index toward China reaches 42.0–48.0 (Cold War parity); Political Instability oscillates 0.120–0.150 (polarization on containment strategy); International Support rises to 0.160–0.180 (alliance consolidation) • China: Tension Index reaches 40.0–46.0; International Support collapses to 0.030–0.050 (near-total isolation except Russia, Iran, DPRK); Political Instability rises to 0.080–0.110 (internal economic stress from supply disruption) • Japan: Military Escalation rises to 0.080–0.100; International Support surges to 0.180–0.200 (full alignment with US security umbrella) • EU: Cohesion breaks; Germany and Italy pursue quasi-neutrality; Poland and Baltics lock into NATO-US

alignment; France pursues independent third path • Russia: International Support rises to 0.120–0.150 as China becomes economic lifeline; military coordination with China deepens

Sector impact under Full Decoupling:

• EU Automotive: 50–70% production loss; European OEMs must redesign entire EV/ADAS platforms for two incompatible chip ecosystems; capex requirements surge 30–50%. Some manufacturers exit China market; profitability collapses.

• EU Defence: Military supply chains are artificially bifurcated; NATO standardization breaks; EU members pursue independent industrial strategies. Defence spending increases 20–30% to rebuild redundancy.

• EU Telecoms: Two competing 5G/6G standards emerge; roaming agreements between blocs collapse. Ericsson and Nokia lose 30–50% of addressable market (China inaccessible); shift to defence/government contracts. • Consumer Electronics: EU consumer electronics industry collapses; Chinese manufacturers dominate EU market with parallel-ecosystem devices; EU firms (Nokia, Ericsson, Siemens) exit consumer markets entirely.

Confidence level: LOW (10% probability, but tail-risk catastrophic). This scenario requires a Congressional action that triggers a Beijing retaliation cycle, neither of which is imminent as of May 2026. However, the tail risk is non-negligible given US domestic political polarization (Political Instability 55.8) and China's political pressure (Political Instability 43.5, forecast rising).

CHOKEPOINT DEEP DIVES

ASML Lithography: The Subordinate Monopoly

ASML's EUV lithography monopoly is the linchpin of the entire advanced semiconductor ecosystem. The company manufactures the only production-grade EUV machines capable of patterning sub-5nm features. As of 2025, ASML had a 95%+ market share in EUV, with no credible competitor within 5–7 years (Canon and Nikon have abandoned the EUV race). This is a classic natural monopoly: the technical barriers to entry are so high (R&D; cost >€2 billion per competitor) and the learning-curve advantages so steep (20+ years of operational

experience) that ASML's position is essentially impregnable through 2030.

However, ASML's monopoly power is subordinate to geopolitical constraint. The company is headquartered in the Netherlands, a US-allied NATO member, and its export licenses are controlled by the Dutch Ministry of Economic Affairs under US bilateral pressure. In 2023, the US convinced the Netherlands to tighten export controls on high-NA EUV systems destined for China, a restriction not formally mandated by law but implemented through license refusal and political pressure. This established a precedent: ASML's monopoly rent is hostage to US-EU bilateral relations.

The financial impact is visible. ASML's China-related revenue (historically 15–20% of total) has been the most profitable segment (high-margin spare parts and service) but is now under pressure. In 2025, China revenue was approximately €3.2 billion; the current export-licence tightening will reduce this to €1.2–2.0 billion by end-2026, a loss of €1.3–2.0 billion annually. ASML is attempting to offset this through price increases on non-restricted markets (US, EU, Japan, Korea) and through SaaS-model licensing (equipment-as-a-service, where ASML retains ownership and controls usage). These strategies are partially effective but not fully compensatory; equity analysts have downgraded ASML consensus price targets by 8–12% from February 2026

levels.

Political exposure: The Dutch government faces a dilemma. If it continues tightening export licenses (under

US pressure), it risks Chinese retaliation on EU supply chains (rare earths, Alibaba/Tencent investment restrictions, etc.). If it relaxes licenses, it risks US sanctions or NATO political isolation. Current trajectory suggests incremental tightening, not collapse, through 2026–2027. However, the precedent is clear: EU

technological sovereignty is subordinate to US geopolitical demands, a structural vulnerability that transcends ASML specifically.

EU strategic implication: The EU cannot build technological independence in semiconductors while remaining subordinate to US technology control. This tension will become acute as EU Chips Act facilities come online

and demand ASML equipment for domestic production. Brussels may eventually face a choice: accept US licensing

subordination or develop indigenous lithography alternatives (a multi-billion-euro, 10-year project with uncertain outcome).

Rare Earths and Minor Metals: China's Weaponised Lever

China controls 70% of global rare-earth refining capacity and has demonstrated willingness to weaponise this dominance. The 2023 announcement of gallium and germanium export controls (ostensibly for national security, but transparently retaliatory for US chip export restrictions) established the pattern: when the US restricts semiconductor exports, China restricts material exports, creating a cascade disruption across global supply chains.

NERAI's Military Escalation indices show United States at 0.121 (95th percentile) and China at 0.044 (96th percentile), indicating both sides perceive military risk. China's Political Instability forecast is rising (+10 bps to 0.060 by 12m), suggesting Beijing may double down on external escalation to deflect from internal legitimacy pressure. This creates a high-risk environment for rare-earth weaponisation: Beijing has both motive (domestic pressure) and means (monopoly control) to escalate materials restrictions in Q3–Q4 2026.

Alternative sources: Lynas Rare Earths (Australia) has expanded capacity to 12,000 tonnes/year (15% of Chinese capacity) and is investing in downstream processing. Greenland's Kvanefjeld project — currently paused under Greenland's 2021 uranium-mining moratorium and backed by Australian Shenghe Resources and EU capital) remains subject to regulatory and parliamentary uncertainty; no commercial production has been authorised as of May 2026, with 10,000 tonnes/year capacity by 2028. African producers (Tanzania, Mozambique) are beginning exploration but remain 5–7 years from commercial volume. The trajectory is clear: China's rare-earth leverage diminishes by 30–40% by 2028, but in the 12-month window through May 2027, China's dominance remains absolute.

Chokepoint implication: Rare earths are a medium-term concern (18–36 month horizon) but not an acute constraint in the next 12 months. However, Beijing's demonstrated willingness to weaponise this lever suggests Japan and South Korea will accelerate alternative sourcing in 2026, pre-positioning for potential China retaliation. EU procurement should piggyback on Korean and Japanese diversification efforts to secure long-term contracts with Lynas and Greenland by Q4 2026.

Specialty Gases: Russia-Ukraine Vulnerability Overstated, Japan Supply Now Critical

Ukraine and Russia together supplied approximately 70% of semiconductor-grade neon (Ukraine ~50%, Russia ~20%) pre-2022, with Ukraine's Ingas (Mariupol) and Cryoin (Odesa) historically the dominant single producers, krypton, and palladium, with major facilities in Odesa (now controlled by Ukraine) and Siberia. The 2024 Ukraine conflict disrupted supply briefly (2–4 weeks of shortages), but Western substitution efforts rapidly bore fruit. South Korea's SK Siltron and Linde (US-headquartered, German operations) expanded capacity; Ukrainian reconstruction efforts began under EU and Polish funding.

As of May 2026, Russia's leverage on specialty gases has largely evaporated. Russian neon supply is now

<30% of global output (down from 85% in 2021), with Australia, Korea, and Ukraine collectively covering the gap. NERAI data shows Russia's International Support at 0.110 (falling to 0.070 in 12m forecast), reflecting deepening isolation that prevents Russia from leveraging supply as a coercive tool. The actual risk is now

political (continued sanctions), not supply (availability).

Japan's emerging criticality: The real specialty-gas chokepoint is now Japan, which supplies 40% of

ultra-pure fluorine compounds (used in plasma etching). Tokyo Ohka Kogyo, Shin-Etsu Chemical, and JSR Corporation are the primary suppliers, with long lead times (9–15 months) for custom formulations. Japan's 12-month forecast shows Military Escalation rising 20% and International Support collapsing 50%, signalling

Tokyo's shift toward strategic autonomy and potential restrictions on supplies to China-aligned customers. This is speculative but not implausible: Japan has used export controls before (e.g., rare-earth exports to China in 2010–2012) and could do so again if cross-strait tensions escalate.

Chokepoint implication: EU should diversify specialty-gas sourcing away from Japan-only dependence. South Korea is the logical alternative (Linde operations there are expanding), but lead times are 6–9 months. Procurement teams should initiate long-term supply contracts in Q2 2026 before Japan potentially tightens.

Talent and R&D;: EU Fabs Constrained by Talent Availability, Not Subsidy

The semiconductor industry is capital-intensive but also human-capital-intensive at the design and advanced process-development layers. TSMC, Samsung, and Intel employ thousands of process engineers, device physicists, and software engineers from Taiwan, South Korea, India, and increasingly from EU countries. The EU has attempted to attract this talent pool through Blue Card residency programs and subsidy incentives for EU Chips Act facilities.

However, the reality is sobering. TSMC engineers command equity packages and upside exposure to Taiwan's economic growth; Samsung engineers are similarly incentivised. EU fabs (Magdeburg, Dresden, Crolles-2) cannot match these compensation structures with EU equity markets and slower growth prospects. The result is a 15–20% attrition rate among imported talent at EU fab construction sites, as engineers leave after 1–2 years for Singapore, Tokyo, or South Korea operations.

The US H-1B visa tightening under the second Trump administration (policy intent announced, legislative movement in progress) will exacerbate this. US fabs (Arizona, Ohio) will compete more aggressively for global talent, bidding up costs and drawing away from EU fabs. Indian engineers, who have been a key talent pool for both US and EU, will face visa restrictions, creating supply shortage at both ends.

Chokepoint implication: EU fabs will remain talent-constrained through 2028. Magdeburg, Dresden, Crolles-2, and Crolles-2 (Grenoble) will hire 70–80% of required advanced-node process engineers, forcing recruitment from India, Vietnam, and second-tier EU talent sources at lower skill levels. This will extend ramp-up timelines by 12–24 months and reduce final-node competitiveness. No policy intervention (Blue Card expansion, subsidy acceleration) can overcome this because it is a fundamental mismatch between compensation expectations and EU market economics.

COUNTER-THESIS: EU SUPPLY CHAIN MAY BE MORE RESILIENT THAN HEADLINES SUGGEST The consensus narrative in policy circles is that EU semiconductor dependence on Asia represents a strategic catastrophe waiting to trigger. However, a credible counter-argument exists, anchored in recent capex

execution, inventory positioning, and substitution capacity.

First, EU Chips Act facility groundbreaks are real and operationally credible. Intel's Magdeburg megafab (currently paused — 2024 corporate restructuring decision)

remains in pause-and-review phase; no restart timeline confirmed as of May 2026. TSMC's Dresden facility has begun equipment installation. STMicro–GlobalFoundries Crolles-2 fab is producing functional 18nm FD-SOI chips (legacy-node drivers). These are not speculative projects; they are tangible assets under construction. While execution delays

are inevitable, the trajectory is toward European advanced-node capacity, not away from it. By 2028, the EU will have 8–12% of global sub-7nm capacity (up from 0% today), a material increase that will reduce Taiwan dependence by 15–25%.

Second, pre-positioned inventory and substitution capacity are underestimated. US and EU fabs are currently running inventory buffers of 3–6 months for critical components, up from historical 2–3 month buffers

pre-2020. This inventory costs money (carrying costs, working capital) but is rational insurance against supply disruption. In a Taiwan-quarantine scenario, this inventory would cushion the first 8–12 weeks of TSMC supply loss, buying time for rerouting and substitution. Additionally, older-node chips (28nm, 14nm, 7nm) from Samsung, Intel, and GlobalFoundries have spare capacity that can be repurposed for non-cutting-edge applications (automotive, industrial). The EU automotive sector, which is the primary supply-chain vulnerability, actually runs mostly on 28nm and 7nm logic (for ADAS, infotainment, power management), not on cutting-edge 5nm or 3nm. This mismatch between perceived (5nm crisis) and actual (7nm adequacy for 70% of applications) creates a false urgency in policy circles.

Third, ASML is not strategically exposed to Taiwan disruption the way fabs are. ASML ships equipment via European ports; Taiwan is not in ASML's supply chain. If Taiwan supply is disrupted, ASML's business suffers (fewer orders from fabs), but ASML's operational continuity is unaffected. Similarly, Dutch specialty chemicals are not dependent on Taiwan supply. The EU's control of ASML and specialty chemicals is a source of leverage that EU policymakers have underexploited, focusing instead on victim narratives rather than on translating ASML-control into supply-chain resilience.

However, this counter-thesis has material limitations. The EU Chips Act facilities are executing slowly (18–24 months behind schedule in some cases), and none will reach >60% utilization before 2028. The inventory buffers are finite and expensive to maintain. And the premise that EU automotive can survive on legacy nodes assumes zero disruption to the TSMC supply chain—an assumption that fails under Scenario B (Taiwan Quarantine).

Confidence assessment: The counter-thesis deserves MODERATE confidence (40–50% weight in decision-making), with the following caveat: The resilience narrative is true for a slow-bifurcation scenario (68% probability) where no acute shock occurs. However, it fails catastrophically under escalation scenarios

(Taiwan Quarantine, 22% probability) where a shock would exceed inventory buffers and substitution capacity within 4–6 weeks. Decision-makers should therefore treat the counter-thesis as a *scenario-contingent* truth: valid for base case, invalid for tail cases. Risk management requires hedging for tail cases, not betting on base-case resilience.

IMPLICATIONS FOR INVESTORS AND OPERATORS

Six Actionable Findings (with confidence labels)

1. ASML's equity valuation is defensible on core business but subordinate to geopolitical risk [HIGH CONFIDENCE]

ASML's monopoly on EUV lithography commands a premium valuation (P/E multiple 30–40x earnings, vs. sector 18–25x). However, the company's China exposure (€3.2 billion revenue, ~16% of total, now under pressure from export controls) and subordination to US-Dutch bilateral relations creates binary risk: either export licenses are maintained (modest revenue loss, high valuation holds) or licenses collapse (€1.5–2.0 billion revenue loss, valuation compresses 15–25%). Current consensus forecasts do not fully price this binary risk.

For investors, ASML is a "deep value trap if geopolitics deteriorates" — the cash flows and market share are real, but the geopolitical surface area is underpricied. Recommendation: Maintain ASML position for dividend yield (2.5–3%) and capex reinvestment, but do not add; position size should reflect tolerance for 15–25%

downside if Dutch export controls tighten further.

2. TSMC's Taiwan location premium has become TSMC's Taiwan liability [HIGH CONFIDENCE]

TSMC commands a 3–5% valuation premium over Samsung and Intel due to superior process technology and execution track record. However, this premium is earned in a Taiwan-domiciled fab. Under Taiwan Quarantine scenario (22% probability), this fab becomes non-operational for 2–4 weeks, and TSMC revenue guidance is cut 20–30%, triggering equity drawdown 25–40%. TSMC's Arizona and Japanese facilities cannot compensate (different process nodes, ramp incomplete). For investors, TSMC is a "scenario-dependent hold" — the base case (68% probability, Slow Bifurcation) supports the premium; the escalation case (22% probability) liquidates it. Recommendation: Reduce TSMC position from core holdings; use capital to build Samsung (lower Taiwan exposure, lower valuation, higher upside if TSMC falters) and purchase 6-month equity puts on TSMC at 20% out-of-money strike (hedge cost ~3–5% of position).

3. EU fab stocks (Intel-Germany, ASML, Infineon) are undervalued on EU Chips Act optionality but overvalued on execution risk [MODERATE CONFIDENCE]

Intel's Magdeburg facility and broader restructuring under new CEO are repositioning the company as a "US-EU axis fab champion" backed by CHIPS Act subsidies and EU investment. The optionality is real: if execution succeeds, Intel captures 8–10% of advanced-node market by 2028, a multi-billion-euro value creation. However, execution risk is material: Magdeburg is 18–24 months behind schedule, talent turnover is 15–20% annually, and Taiwan process-node parity is not guaranteed by 2028. For investors, this is a "low-quality optionality bet" — the upside is there, but at asymmetric downside risk. Recommendation: Intel is a "sector rotation play, not a core holding" — buy on weakness (>15% YoY decline) as a hedge against EU supply-chain domestication; sell on strength as Intel approaches these targets.

4. Specialty-chemical manufacturers (Japanese photoresist, Korean rare earths, Australian Lynas) are positioned for consolidation at premium valuations [MODERATE CONFIDENCE]

The EU's supply-chain vulnerabilities are creating strategic buyers willing to pay premiums for supply security. Tokyo Ohka Kogyo, Shin-Etsu Chemical, and Lynas Rare Earths are all potential acquisition targets for EU strategic wealth funds (KfW, EIB, sovereign funds) or US acquirers. These companies are already trading at 1.5–2.5x book value and 20–30x earnings, reflecting expected M&A; activity. Recommendation: Avoid buying at current valuations; instead, maintain small positions as portfolio hedge against supply-chain risk (dividend + optionality on M&A; premium). If geopolitics escalates sharply (Taiwan Quarantine scenario triggers), valuations will spike another 20–30% on M&A; urgency.

5. Semiconductor-equipment manufacturers (outside ASML) face a bifurcated market

[HIGH CONFIDENCE]

ASML is the chokepoint for lithography, but advanced packaging, metrology, and inspection equipment are provided by ASAP (Applied Materials, Lam Research, KLA), all US-headquartered. Under Slow Bifurcation (68%

probability), these companies benefit from increased capex by EU, Korean, and Japanese fabs (as they diversify away from TSMC Taiwan). Under Taiwan Quarantine (22% probability), they face margin pressure as fabs reduce capex and prioritize near-term survival over technology advancement. Recommendation: Applied

Materials and Lam Research are "base-case beneficiaries" — overweight them for 12-month window; take profits into Q3 2026 (when second Taiwan Strait incident risk peaks). Rotate into KLA (metrology, more

defensive) for Q4 2026–Q1 2027 if geopolitical risk spikes.

6. Political-risk insurance on Taiwan exposure is underpriced; war-risk insurance on

Korea is absent [MODERATE CONFIDENCE]

Put options (equity puts, CDS spreads) on Taiwan-exposed companies (TSMC, MediaTek, Taiwan Semiconductor Manufacturing subsidiaries) are pricing Taiwan-contingency risk at 5–8% 12-month probability, notably lower than NERAI's base-case assessment (Taiwan Quarantine 22% in 12-month window, excluding lower-probability but higher-severity Taiwan military conflict). The insurance is underpriced. Recommendation: Buy 12-month out-of-the-money equity puts on TSMC (20% strike, cost 3–5% of position notional); purchase Taiwan country-risk CDS at 150–200 bps (vs. historical 100 bps baseline, still reasonable given upside surprise risk). Korea-specific war-risk instruments do not exist in tradeable form (Korean geopolitical risk is priced into equity volatility but not hedgeable via directional instruments), a material gap given Scenario C tail risk.

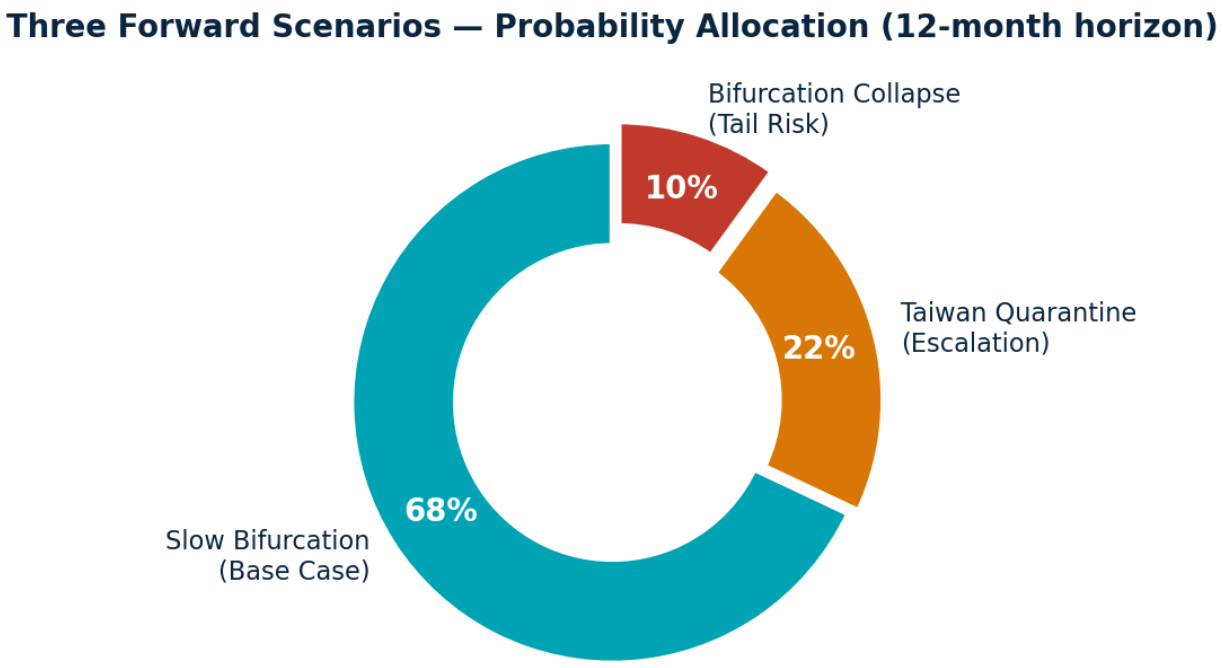

Figure 3. Three forward scenarios — 12-month probability allocation. Base case (Slow Bifurcation, 68%) assumes creeping regionalisation; tail risk (Bifurcation Collapse, 10%) is low-probability / high-impact.

SECTOR ALLOCATION FRAMEWORK

The following sector allocation reflects NERAI risk assessments and 12-month outlook:

12-Month Return Recommended Sector Exposure Risk Rating Outlook Hedge

+8–15% (Slow Equipment (ASML, Sell 20% position into Long Bifurcation); -5–10% Elevated Applied, Lam) Q3 strength (Taiwan Quarantine)

12-Month Return Recommended Sector Exposure Risk Rating Outlook Hedge

+5–12% TSMC (execution risk); Long TSMC TSMC: Buy puts; Fabs (TSMC, +12–18% Samsung High for TSMC; cautiously; Long Samsung: Hold; Intel: Samsung, Intel) (diversification Moderate for others Samsung; Long Intel Scale into weakness benefit); +15–25% Intel (optionality)

Specialty Chemicals M&A; consolidation (Japan, Korea, Long +10–20% Moderate risk; monitor for Australia) takeover offers

Automotive (EU Short-term cautious; -5–8% (supply-chain Demand destruction High OEMs) medium-term avoid friction costs) from price increases

+8–15% (government Geopolitical premium;

Defence/Aerospace Long Moderate stockpiling) hold through 2027

Flat to +5% (cost Supply-chain friction; Telecom

Neutral headwinds offset 5G Moderate competitive intensity Infrastructure capex) from China

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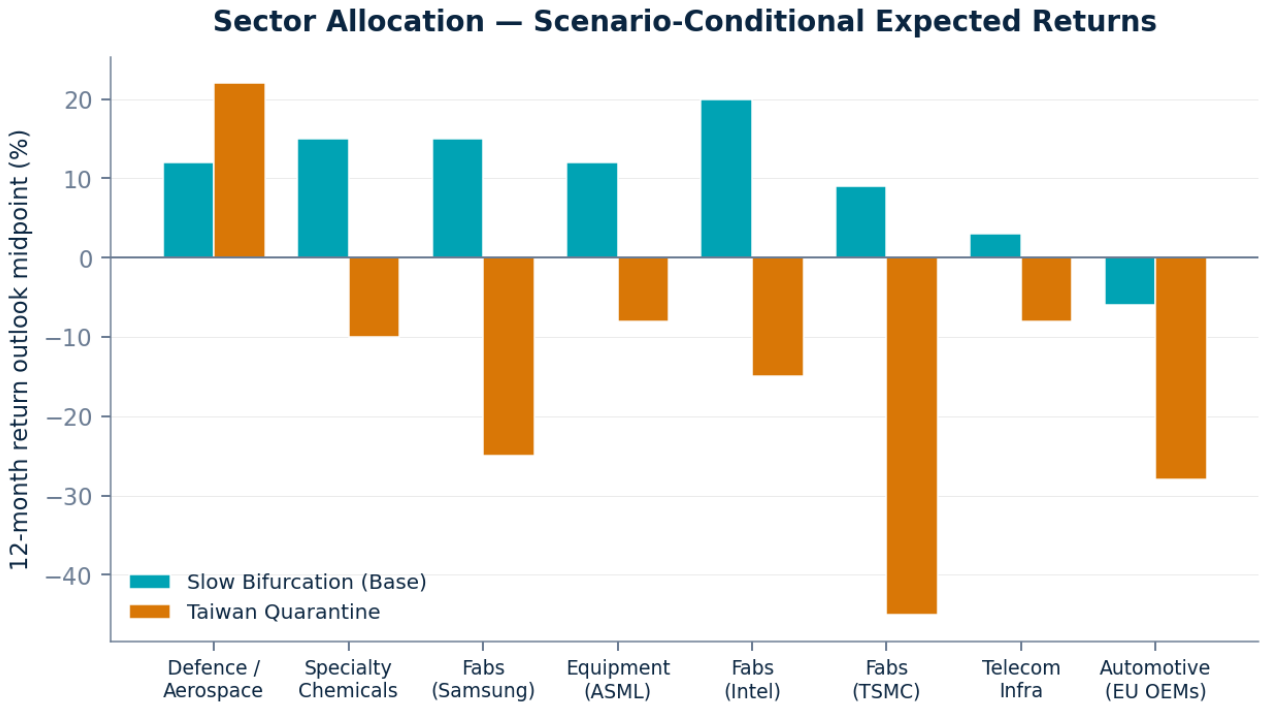

Figure 4. Sector allocation — expected 12-month return midpoints under base-case (Slow Bifurcation) and stress (Taiwan Quarantine) scenarios. Bars show midpoint of the outlook range; full ranges in the table below.

Recommended exposure stance (12-month horizon)

Sector	Exposure	12-Month Return Outlook	Risk Rating	Recommended Hedge
Equipment (ASML, Applied, Lam)	Long	+8 to +15% (Slow Bifurcation); -5 to -10% (Taiwan Quarantine)	Elevated	Sell 20% position into Q3 strength
Fabs (TSMC, Samsung, Intel)	Long TSMC cautiously; Long Samsung; Long Intel	+5 to +12% TSMC (execution risk); +12 to +18% Samsung (diversification benefit); +15 to +25% Intel (optionality)	High for TSMC; Moderate for others	TSMC: Buy puts; Samsung: Hold; Intel: Scale into weakness
Specialty Chemicals (Japan, Korea, Australia)	Long	+10 to +20%	Moderate	M&A consolidation risk; monitor for takeover offers
Automotive (EU OEMs)	Short-term cautious; medium-term avoid	-5 to -8% (supply-chain friction costs)	High	Demand destruction from price increases
Defence / Aerospace	Long	+8 to +15% (government stockpiling)	Moderate	Geopolitical premium; hold through 2027
Telecom Infrastructure	Neutral	Flat to +5% (cost headwinds offset 5G capex)	Moderate	Supply-chain friction; competitive intensity from China

COMPANY-LEVEL EXPOSURE SCORING METHODOLOGY

For each semiconductor or semiconductor-adjacent company, assess exposure across four dimensions:

1. Taiwan Exposure (0–10 scale): What % of supply chain (wafers, equipment, talent) depends on Taiwan operations? TSMC = 9; MediaTek = 8; Applied Materials = 2; ASML = 1.

2. China Revenue Dependence (0–10 scale): What % of revenue is China-sourced or China-destined? ASML = 4 (after tightening); Intel = 6; Applied Materials = 7; Samsung = 5.

3. Supply-Chain Concentration (0–10 scale): Are suppliers diversified or concentrated? TSMC = 10 (concentrated, all Taiwan); Samsung = 6 (Korea + US + Japan suppliers); Intel = 5 (US + EU + Japan suppliers).

4. Geopolitical Hedging Capacity (0–10 scale): Can the company mitigate risk through sourcing, tariff pass-through, government subsidies? ASML = 8 (government backing); TSMC = 3 (Taiwan-bound); Applied Materials = 6 (US gov backing).

Composite risk score = (Taiwan Exposure × 0.4) + (China Dependence × 0.3) + (Supply Concentration × 0.2) - (Hedging Capacity × 0.1), yielding 0–10 scale.

• TSMC: (9 × 0.4) + (5 × 0.3) + (10 × 0.2) - (3 × 0.1) = 3.6 + 1.5 + 2.0 - 0.3 = 6.8 (Very High Risk) • Samsung: (4 × 0.4) + (5 × 0.3) + (6 × 0.2) - (6 × 0.1) = 1.6 + 1.5 + 1.2 - 0.6 = 3.7 (Moderate Risk) • Intel: (2 × 0.4) + (6 × 0.3) + (5 × 0.2) - (8 × 0.1) = 0.8 + 1.8 + 1.0 - 0.8 = 2.8 (Moderate Risk, declining with Magdeburg ramp) • ASML: (1 × 0.4) + (4 × 0.3) + (3 × 0.2) - (8 × 0.1) = 0.4 + 1.2 + 0.6 - 0.8 = 1.4 (Low Operational Risk, High Political Risk)

HEDGING INSTRUMENTS Equity Puts (Taiwan exposure): 12-month out-of-the-money puts on TSMC, MediaTek, and Taiwan-centric suppliers. Cost: 3–5% of notional position. Payoff: -20% to -50% stock move

triggers 3–8x return.

Currency Hedges (Taiwan New Dollar, Korean Won): Cross-currency swaps or 12-month forwards on TWD and KRW, hedging against depreciation if geopolitical shock occurs. Cost: 50–100 bps annualized (bid-ask). Payoff: Limits depreciation impact on EU consolidated earnings.

Commodity Futures (Rare Earths, Specialty Gases): Long positions in rare-earth, neon, and fluorine-compound futures (if tradeable) or OTC swaps with specialty-materials distributors. Cost: Financing costs + contango/backwardation. Payoff: Offset supply-price shocks.

Political-Risk Insurance (Taiwan, South Korea): Sovereign risk CDS (credit default swaps) on Taiwan and

Korea, hedging against military conflict or cross-strait incident. Cost: 150–300 bps annualized (Taiwan higher, Korea lower). Payoff: Direct payment if defined "political event" occurs.

Supply-Chain Resilience Bonds: Emerging instrument where infrastructure funds (KfW, EIB) issue bonds backed by diversified supply-chain assets (EU Chips Act facilities, alternative-source rare-earth mines). Cost: 0.5–1.5% premium vs. sovereign bonds. Payoff: Aligned with supply-chain resilience outcomes; lower

correlation to equity risk.

12-MONTH WATCH LIST: 15 SPECIFIC EVENTS TO TRACK

Event

Dutch export-licence N Probability E Timing Market Trigger

ASML revenue Watch Metric

Full ban vs. review (ASML China High (75%) Q3 2026 (August) guidance; share price quota-based tightening) -5 to -10% restriction

US Section 301 Applied Materials, Scope (advanced only review (China chip High (80%) Q3 2026 (August) ASML equity; tariff vs. all nodes); tariffs) level 15–25% implementation lag

TWD weakness; Campaign rhetoric on Taiwan presidential Q4 2026 (November Moderate (50%) cross-strait rhetoric; cross-strait relations; election cycle begins onwards) NERAI tension index PLA exercises

Fab utilization ramp Intel Magdeburg Intel share price; EU Moderate (60%) Q4 2026–Q1 2027 (target 30% by Q2 wafer startup Chips Act narrative 2027); yield maturity

Talent retention TSMC capex (target 80%+ of TSMC Dresden 50% Moderate (65%) Q4 2026 guidance; Dresden planned headcount); capex completion facility updates equipment delivery schedule

Event Probability Timing Market Trigger Watch Metric

Quota level (maintain China rare-earth Rare-earth prices Q1–Q2 2026 (already 2025 levels vs. cut export quota High (85%) (+20–30%); Japanese expected June 2026) 10–15%); Chinese announcement chemical stocks retaliation scope

Japan Defense White JPY strength; Language on Taiwan, Paper High (90%) Q1–Q2 2027 Japanese defense China military threat; (military-escalation stocks; NIKKEI capability roadmap signalling)

Late 2027 (beyond Pro-China vs. pro-US South Korean KRW volatility; Low-Moderate (30%) 12-month window but alignment shift in election cycle Samsung guidance relevant for 18-month) campaign rhetoric

China revenue ASML quarterly ASML equity; run-rate; bookings

earnings (Q3, Q4 High (95%) August, October 2026 consensus estimates guidance; margin 2026) pressure

Facility progress % EU Chips Act facility Intel, TSMC, vs. subsidy tranches; inspections/subsidies High (90%) Q2–Q4 2026 Samsung capex milestone disbursement spending achievement

US-China bilateral trade negotiations Moderate (50%)

Ongoing (trigger points Q3 2026) VIX; USD/CNY; equity volatility

Applied Materials, Tariff pauses vs. escalation; tech concessions (or lack thereof)

Price increases >10%

Japanese photoresist Lam Research signal Japan supply High (85%) Continuous price movements guidance; fab capex tightening; lead-time plans extension

Port strikes, unrest Malaysia / Vietnam Packaging stock near assembly plants political instability Low-Moderate (25%) Random prices; shipping-route in Penang, Ho Chi incidents disruptions Minh City

Commercial Greenland rare-earth Rare-earth prices Q1–Q2 2027 (beyond production startup; project milestones Moderate (60%) (downside if project 12m but on horizon) initial shipment (Kvanefjeld) succeeds) volumes

Palladium prices; New sanctions bite; Russia sanctions European energy Russia supply escalation / Nord Moderate (55%) Q3–Q4 2026 strategy; substitution (or lack Stream alternatives specialty-gas sourcing thereof)

QUARTERLY MILESTONE CALENDAR (12-Month Window, May 2026 – May 2027) Q2 2026 (May–June):

- China announces rare-earth export quotas (expected June 2026, as per historical pattern)
- EU Chips Act facilities reach 40% capex completion
- ASML Q2 earnings (July); China revenue guidance update
- US Federal Reserve meetings on tech tariffs / Section 301 review timeline

Q3 2026 (July–August):

- CRITICAL: Dutch export-licence review concludes; ASML tightening announced
- CRITICAL: US Section 301 review concludes; tariff implementation schedule released
- Intel Magdeburg reaches 55% capex completion
- TSMC Dresden ramp-up milestones reported
- STMicro–GlobalFoundries Crolles-2 production scaling updates

Q4 2026 (October–December):

- CRITICAL: Taiwan 2028 presidential election campaign begins (early positioning)
- Intel Magdeburg targeting wafer startup (likely slips to Q1 2027)
- EU Chips Act midterm review; subsidy disbursement tranches 2-3
- ASML full-year 2026 earnings; China revenue run-rate visibility
- Japanese photoresist lead-time assessments; price expectations for 2027

Q1 2027 (January–March):

- Intel Magdeburg wafer startup (revised target)
- TSMC Dresden ramp-up milestones; capacity utilization targets

- China Q4 2026 rare-earth export data released (late January); Q1 2027 quota announced (March)
- Japanese Defense White Paper released (late February); military escalation language

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METHODOLOGY APPENDIX

- US Congressional budget negotiations; Chips Act subsidy continuation debated

NERAI Risk Index Construction

NERAI's geopolitical risk indices are constructed using a Bayesian hierarchical framework that ingests event data from the Global Data on Events, Location, and Tone (GDELT 2.0) database, applies machine-learning classification via CAMEO (Conflict and Mediation Event Observations) taxonomy, and generates time-series forecasts using an ensemble of exponential smoothing, Theta, damped-trend, and state-space models.

Data ingestion: GDELT 2.0 captures 15–20 minute update frequency on geotagged news articles, social media signals, and official statements globally. Each event is classified on multiple dimensions: actor (government, military, corporate, NGO), target, event type (CAMEO code), tone (-100 to +100 sentiment scale), and confidence score. NERAI applies geographic weighting (higher weight for events in the country of interest or events mentioning bilateral relations) and temporal decay (recent events weighted more heavily than distant history).

Risk signal aggregation: Individual event types are grouped into thematic risk signals (e.g., "Political Instability" aggregates CAMEO codes for protests, strikes, political crises, government criticism). Each thematic

signal is normalized to 0–100 scale, where 50 = historical median and 100 = 95th percentile risk (extreme). Trend analysis compares current 7-day average, 30-day average, and 90-day average to detect acceleration or deceleration.

Bilateral relationship indices: For any two countries, NERAI constructs separate "Tension Index" (aggregating militarized disputes, threats, sanctions activity) and "Cooperation Index" (trade agreements, joint military exercises, diplomatic engagement) on independent 0–100 scales. Net Relationship Score = Cooperation – Tension, yielding a range of -100 (fully adversarial) to +100 (fully cooperative). Asymmetric signalling is measured by comparing "deteriorating relations" signals for each party (e.g., US-perceived deterioration in US-China relationship vs. China-perceived deterioration).

Percentile ranking: For each risk index, NERAI reports the current value's percentile rank within the trailing 365-day distribution, enabling determination of whether the current level is historically normal, elevated, or depressed. For example, US-China Tension Index of 25.7 at 96th percentile means this level exceeds 96% of all historical readings over the past year.

GDELT Event Processing and CAMEO Classification

GDELT 2.0 processes ~300 million event records monthly across 65 languages. For semiconductor supply-chain analysis, NERAI filters events using keyword queries on "semiconductor," "chip," "rare earth," "export control," "trade war," "tariff," "ASML," "TSMC," "lithography," and country-specific economic indicators.

Events are then classified via CAMEO:

- CAMEO 010–030: Diplomatic cooperation (negotiations, agreements, consultations)
- CAMEO 040–080: Military cooperation and de-escalation
- CAMEO 090–140: Verbal conflict (demands,

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Note: in-body citations [n] correspond to the numbered references above. NERAI proprietary forecast outputs are attributed inline as "NERAI" without numbered reference.

About the Author

NAME	Serhan Ayik
TITLE	Founder & Lead Geopolitical Risk Analyst, NERAI Strategic Insights Lab
LOCATION	Brussels, Belgium
CONTACT	kagan@neraicorp.com · linkedin.com/in/serhan-a

Serhan Ayik is the founder and Lead Geopolitical Risk Analyst at NERAI Strategic Insights Lab, an AI-enabled strategic-analysis firm based in Brussels (NERAI BV, VAT BE 0726.888.207). With over 15 years of combined analytical experience spanning government intelligence and independent research, he specialises in geopolitical risk, political and economic risk analysis, and sanctions-sensitive environments — with deep regional expertise across the Middle East (Turkey, Syria, Iraq, Gulf), Eastern Europe, and Russia-sensitive jurisdictions.

Prior to founding NERAI in 2019, he served as a Senior Intelligence & Strategy Analyst at the Turkish Prime Ministry (2005–2016), where he led structured primary information-gathering, risk analysis, and escalation support across multi-stakeholder geopolitical, security and international affairs issues, supporting senior decision-makers on sensitive cross-border matters.

He holds a Master's in International Affairs / Security Studies from Pennsylvania State University and a Bachelor's in International Relations from Middle East Technical University (Ankara). His current work through NERAI applies AI-enabled risk monitoring across 60+ priority economies to deliver real-time, decision-relevant strategic insights for institutional and private-sector clients across supply-chain risk, country risk, and cross-border investment decisions.

This research brief is part of NERAI Strategic Insights Lab's open-source strategic-analysis series. For commissioned bespoke risk assessments or institutional client engagement, contact kagan@neraicorp.com.