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Geopolitics of the AI Supply Chain: Control, Dependency, and National AI Ecosystems in the US, EU, China, and the UAE

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Research Report

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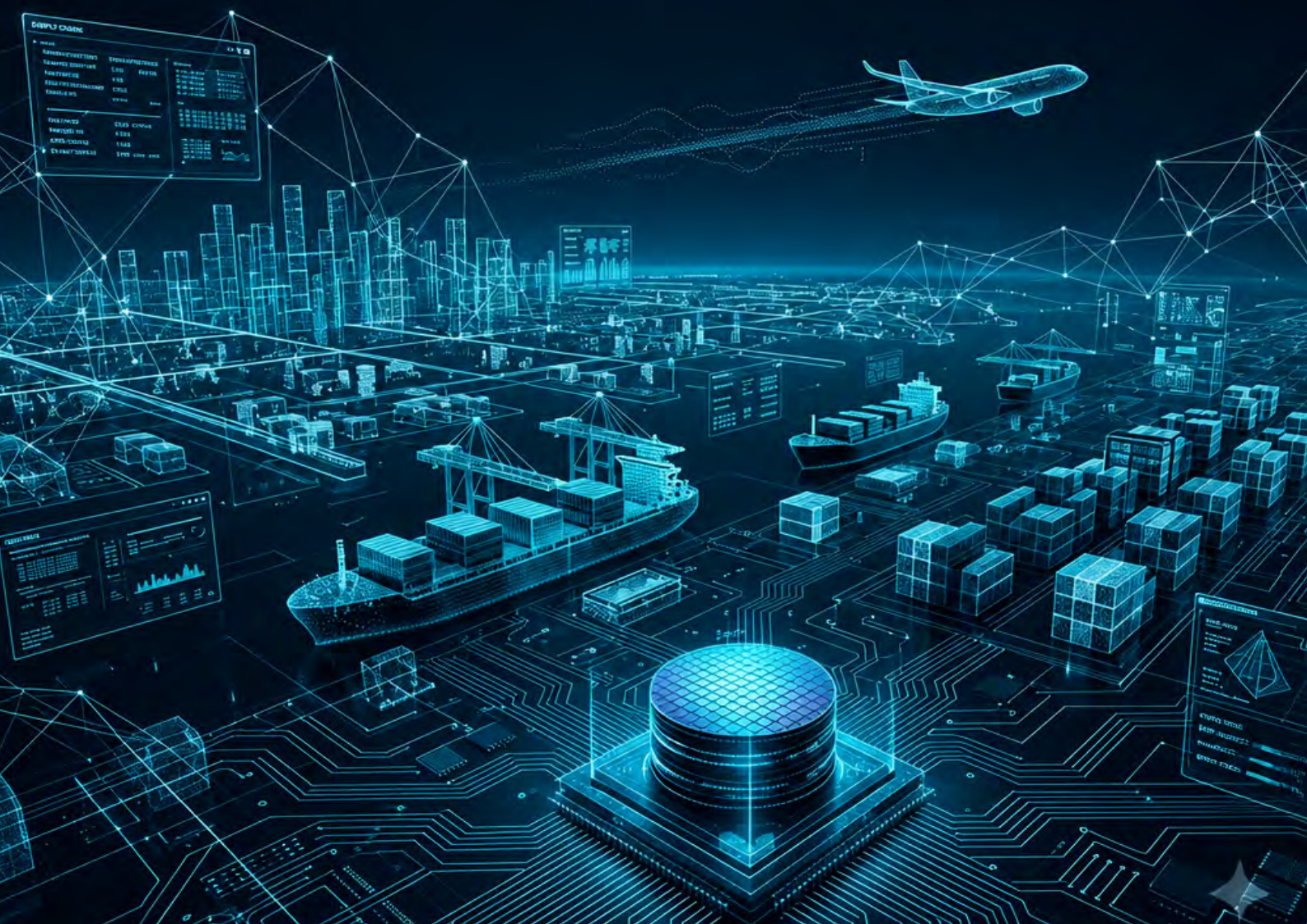

Technology and International Affairs

The Technology and International Affairs project at LSE IDEAS examines the pace of technological change, impacting the nature and conduct of international relations. Through three research clusters, the project builds on the work previously done by the Digital International Relations project, bringing together research, publications, and experts to address critical questions at the intersection of technology and international affairs - reshaping power, security, and governance.

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GEOPOLITICS OF THE AI SUPPLY CHAIN: CONTROL, DEPENDENCY, AND NATIONAL AI ECOSYSTEMS IN THE US, EU, CHINA, AND THE UAE

EXECUTIVE SUMMARY

First, the AI supply chain is structurally asymmetric and that asymmetry is itself a source of geopolitical leverage. Our analysis reveals a highly uneven distribution of control and dependency across compute, finance, and talent. The US occupies a dominant position across all three pillars, functioning as a multi-pillar bottleneck controller: it designs the most advanced AI accelerators, hosts the world's deepest private AI capital markets, and remains the primary destination for top global AI researchers. China, by contrast, has achieved meaningful self-reliance in finance and talent but faces a critical structural constraint in compute, with US-led export controls having greatly hindered its access to frontier AI chips. The EU[1] leverages its regulatory architecture and upstream chokepoint assets (notably ASML's lithography dominance[2]) to exercise indirect influence, while the UAE has used sovereign capital to embed itself strategically within the global AI landscape despite near-total dependence on externally-sourced compute and human expertise. These structural positions reflect deliberate national strategies and shape the options available to governments and firms alike.

> China, by contrast, has achieved meaningful self-reliance in finance and talent but faces a critical structural constraint in compute.

Second, export controls and investment screening have emerged as the primary instruments of AI statecraft, with cascading consequences throughout national AI ecosystems. The successive tightening of US restrictions on advanced AI chips and semiconductor manufacturing equipment has fundamentally restructured China's AI hardware landscape, accelerating the development and adoption of domestic alternatives such as Huawei's Ascend series while deepening the frontier performance gap. The same control architecture conditions the UAE's access to advanced compute: large-scale chip shipments and infrastructure projects proceed only through politically-negotiated arrangements such as reciprocal commitments to US-aligned supply chains. For the EU, participation in coordinated export restrictions on lithography tools confers a degree of leverage over technology access that its modest AI accelerator base would not otherwise provide. Across all four cases, the rules governing who can access what hardware, and on what terms, have become as strategically consequential as the technologies themselves.

1 The European Union (EU) is not a sovereign country but a political and economic union comprising 27 member states. In this report, the EU is treated as a single unit of analysis to facilitate comparison with state-level actors.

2 ASML Holding N.V.: a Dutch multinational corporation and largest supplier of semiconductors in the industry.

Third, national AI governance models reflect divergent AI ecosystems, and these divergences produce distinct competitive and structural profiles that complicate any simple notion of a single 'AI race'. The US pursues innovation primacy through private-sector-led deregulation, relying on market dynamics and export controls rather than direct industrial ownership. China deploys state-guided industrial policy, channelling fiscal expenditure toward predefined sectoral targets and self-reliance goals. The EU places strategic priority in private sector investment facilitation and binding regulation, whilst using the latter as both a tool of sovereignty and a shaping instrument for global norm diffusion. The UAE, lacking deep domestic talent pipelines or homegrown compute capacity, converts its sovereign wealth into strategic positioning, leveraging financial commitments to secure preferential access to infrastructure and technology partnerships. These differences mean that dependency structures are constitutive features of each case's AI ecosystem and must be understood as such when assessing the trajectory of their AI strategies.

1. BACKGROUND

The global AI landscape is being reshaped by intensifying geopolitical rivalry and increasingly complex forms of technological interdependence. In response, states are actively structuring their national AI ecosystems through regulatory frameworks, commercial incentives, and ethical guidelines. However, this strategic environment is further mediated by cross-border dependency structures. Countries rely on global networks for compute hardware, financial capital, and highly-skilled AI talent. While these dependencies might be benign in periods of stable international cooperation, they risk becoming sources of vulnerability during periods of geopolitical tension, such as restrictions placed upon resource access by external actors.

We use the terms *compute*, *finance,* and *talent* within the following contexts:

(1) **Compute:** Access to advanced chips and infrastructure needed for the training and operation of AI models. Due to such hardware requirements, high-end compute capacity is often contingent on external supply chains and export control regimes, making countries vulnerable to being over reliant on particular vendors/suppliers.

(2) **Finance:** The number of financial resources available to a country to support domestic AI development. Different countries have different models through which the flow of such capital is attained – from US private-sector investment to EU de-risking mechanisms, China's state-guided funds, and the UAE's sovereign wealth-driven approach. This creates differentiated dependencies on domestic, as compared to international sources of capital.

(3) **Talent:** Attracting high-skilled workers with deep expertise who can build, evaluating, and deploying cutting-edge AI systems is a vital part of the national AI ecosystem. States must not only cultivate domestic talent pipelines for domestic AI firms but balance this with global talent recruitment with consideration given to immigration policies, mobility incentives, and geopolitical frictions as these may disrupt access to critical human capital.

These patterned differences across compute, finance, and talent produce country-specific risk profiles which shape the strategic options available to countries. Consequently, different governments adopt distinct adaptive strategies to mitigate their vulnerabilities amidst geopolitical uncertainty.

2. ANALYTICAL FRAMEWORK

Level 1: National Strategic Direction and AI Policy Environment

Objective: To provide an overview of each country's national objectives in the AI domain as identified through its national-level strategic priority areas and supplemented with an outline of how these strategic priorities have been distilled into policies within each of the target cases (e.g., the US, China, the EU, and the UAE).

Approach: This analysis involves scoping out the national AI policy environment in the US, EU, China, and the UAE, broken down into three critical pillars:

Regulatory Frameworks (What can/cannot be done?)

We explore the legal mandates and restrictions placed on the AI system development and deployment process. This includes examining rules governing data usage (e.g., personally identifiable information) and requirements for traceability, accountability, documentation, and human oversight.

These frameworks reveal how countries constrain or enable AI activities according to their strategic aims.

Commercial Incentives (How to incentivise innovation?)

We focus on the economic policies and mechanisms that governments use to drive domestic AI innovation and competitiveness. This includes the provisioning of state funding, R&D tax breaks, the creation of national AI Venture Capital (VC) funds, public procurement mandates that favour domestically-developed AI solutions, and support for IP protection and patenting.

These instruments illustrate how states channel resources toward the sectors and capabilities they prioritise.

Ethics and Norms of AI Development (What values are guiding AI development?)

We examine the 'soft' (i.e., guidelines) and hard (i.e., binding) regulations that are intended to ensure responsible and trustworthy AI. This includes key principles such as fairness, transparency, accountability, robustness, and safety (as seen in frameworks like the NIST AI RMF or Google's AI Principles). We will also assess whether these norms are merely aspirational declarations or codified into regulation and enforced through specific auditing requirements.

This pillar reflects how countries embed their values, governance philosophies, and international ambitions into the future trajectory of AI develop

Level 2: Dependency Networks in the AI Supply Chain

Objective: To assess each country's current capabilities and structural dependencies that exist within the national ecosystem.

Approach: This involves mapping the key dependencies and resource networks shaping the national AI ecosystem - this examination involves an approach across:

1. Current capabilities: What resources does the country currently possess?

2. Dependency structure: Where are the areas where a country is externally reliant and what is the configuration of such reliance?

3. Adaptation and transition pathways: What is the direction of travel sought by the country in this regard?

In doing so, we seek to distinguish between *present conditions* and *future trajectory*, to link structural dependencies with national (policy) trajectories.

We will conduct our mapping and analysis across three thematic pillars:

Infrastructure/Hardware

For **current capabilities**, we map the country's existing compute supply, including availability of high-end compute chips and other forms of compute infrastructure, and domestic production capacity.

For **dependency structure,** we analyse reliance on foreign hardware imports, global supply chains, and chokepoint technologies (e.g., China's reliance on advanced GPU imports; the UAE's reliance on imported or second-hand compute hardware).

For **adaptation and transition pathways**, we examine efforts toward supply chain diversification or indigenous capacity building, such as China's push for self-reliant high-end compute hardware or the UAE's strategic partnerships with global cloud providers.

Finance

For **current capabilities**, we outline the structure of domestic capital markets and availability of domestic AI-focused investments.

For **dependency structure**, we analyse foreign investment flow models, including financing sources such as venture capital, and cross-border acquisitions.

For **adaptation and transition pathways**, we evaluate national frameworks that impact capital ecosystems, such as the state-led investment approaches in China, the EU's facilitation of private financing through de-risking investments, and the US' de-regulation efforts to stimulate greater private sector investment.

Talent

For **current capabilities**, we assess the domestic talent pool and talent pipeline and availability and quality of training institutions which contributes to the national AI talent base.

For **dependency structure,** we assess the degree of reliance on foreign immigration for talent pipeline, such as US reliance on global STEM immigration or the UAE's reliance on imported AI specialists.

For **adaptation and transition pathways**, we assess how states seek to reshape their domestic talent ecosystems, such as China's returnee programmes; UAE's residency reforms; EU talent mobility schemes).

Having mapped the network and identified resource dependencies, we will seek to categorise each case's structural position within the AI supply chain. The following terms are used:

Control*:* Defined as the ability of a country to set the terms of, or restrict, access to a critical resource input (i.e., hardware, finance, or talent) for other countries. A country with 'control' in a specific pillar holds a unique, difficult-to-replicate, or bottleneck asset that others must rely on.

Dependency*:* Defined as the reliance of a country on external sources (other countries, foreign firms, or international talent) to secure a critical resource input necessary for its own domestic AI development.

3. NATIONAL AI POLICY ENVIRONMENTS

3.1 The United States – National Direction and Key Priorities

AI Action Plan

"The US is in a race to achieve global dominance in artificial intelligence."

MISSION

Maintain and enhance US global leadership in AI to promote human flourishing, economic competitiveness, and national security (Executive Office of the President, 2025).

OBJECTIVE

Implement a federal AI Action Plan that accelerates private-sector-led innovation, scales domestic AI infrastructure, and aligns allies around US AI technologies in order to 'win the AI race' (White House, 2025).

5

AI INDUSTRY FOCUS AREAS

Frontier and foundation models; large-scale cloud and compute infrastructure (including semi-conductors and energy); open-source/open-weight models; and dual-use applications in security, health, and critical infrastructure.

KEY SECTORS

Data centres; semiconductor fabrication and advanced manufacturing; energy infrastructure; biotechnology and biosecurity; scientific research (Crossan *et al.*, 2025).

The US' current national direction on AI is to sustain and expand global AI dominance by removing perceived regulatory barriers, accelerating private-sector innovation, and building out large-scale compute and energy infrastructure. National policy is intended to enhance US AI dominance in support of human capital development, economic competitiveness, and national security. America's AI Action Plan, launched in 2025, translates this into three pillars: (1) accelerating AI innovation by deregulation and encouraging open-source and open-weight models; (2) building domestic AI infrastructure at scale, including semiconductors, data centres, and energy capacity; and (3) using diplomacy tools and associated instruments such export controls and investment screening to secure US technological advantages and limit adversaries' access to advanced AI.

At the same time, legacy initiatives from the previous administration continue to shape the ecosystem. The CHIPS and Science Act channels around $280 billion into semiconductors, research, and STEM workforce development – underpinning long-term AI competitiveness. The National AI Research Resource (NAIRR) pilot expands academic access to compute and data through public–private partnerships (U.S. National Science Foundation, no date). NIST's AI Risk Management Framework remains the primary federal reference point for managing AI risks, even as the Trump administration signals an intention to revise aspects seen as constraining innovation.

These elements collectively position the US as a market-led, national security-conscious AI power. The federal government concentrates on enabling infrastructure, export-control and deploying investment tools, and formulating high-level AI risk management frameworks, while leaving most detailed governance and commercial experimentation to firms, states, and sectoral regulators.

Regulatory frameworks

The US still lacks a single comprehensive AI statute at the national (federal) level. Instead, AI is governed through a combination of executive actions, sector-specific regulation, and general competition, consumer-protection, privacy, and civil-rights law. NIST's AI Risk Management Framework, now extended by a 2024 profile for generative AI systems, provides voluntary guidance structured around the functions 'Govern, Map, Measure, Manage' (National Institute of Standards and Technology, 2022, 2026).

For the public sector, there are federal requirements for governance, impact assessment, and minimum safeguards for AI systems used by agencies (Executive Office of the President, 2024). Although, some of these obligations were revised under the Trump administration's 2025 AI policy shift: governance, inventory, and minimum risk-management requirements for the agency use of high-impact AI.[3] At the state level, state-level privacy and algorithmic accountability laws (e.g., California's California Privacy Rights Act and emerging AI-specific bills) and sectoral regulators (e.g., Consumer Financial Protection Bureau) continue to shape constraints on AI deployment in domains like healthcare, finance, and employment. Export-control and investment-screening measures targeting advanced semiconductors and AI-related technologies further embed national-security considerations into the regulatory environment.

> "These elements collectively position the US as a market-led, national security-conscious AI power."

Commercial incentives

Commercial incentives for AI in the US are primarily channelled through broad industrial-policy and science-funding instruments rather than AI-specific subsidies. The CHIPS and Science Act commits roughly $280 billion to bolster semiconductor manufacturing, R&D, regional tech hubs, and a more inclusive STEM workforce, with the explicit aim of strengthening AI-relevant supply chains and US competitiveness vis-à-vis China. Federal agencies such as National Science Foundation (NSF) and Defense Advanced Research Projects Agency (DARPA) continue to fund foundational AI research through dedicated programs, including NSF's National AI Research Institutes and DARPA's AI research portfolio and challenge-based initiatives (Defense Advanced Research Projects Agency, no date; U.S. National Science Foundation, no date). Public-private initiatives like the NAIRR pilot improve access to high-end compute, datasets, and models for researchers and start-ups, effectively acting as an innovation subsidy for non-hyperscale actors.

The US also maintains one of the world's deepest private-capital markets for AI, with venture capital, big-tech corporate investment, and capital-market access providing the dominant funding channels for AI firms. Emerging outbound-investment controls restrict US capital from flowing into Chinese AI and advanced-chip firms, indirectly steering private investment towards domestic and allied AI ecosystems (Sutter, 2025; Cimino-Isaacs and Sutter, 2026).[4] Current debates around expanding CHIPS-related tax credits to AI data centres and compute infrastructure illustrate how industrial policy is being recalibrated to support the massive capital requirements of frontier-model development without moving towards direct state ownership (Reuters, 2025b).

3 Executive Order 14179 (23 January 2025) rescinds OMB Memorandum M-24-10 and M-24-18 while OMB Memorandum M-25-21 (dated 3 April 2025) retains the minimum risk-management requirements for high-impact AI.

4 Executive Order 14105

Ethical frameworks/guidelines

US ethical guidance for AI is based on a layered, generally non-binding architecture. *The Blueprint for an AI Bill of Rights* articulates five normative protections: (1) safe and effective systems, (2) algorithmic discrimination protection, (3) data privacy, (4) notice and explanation, and (5) human alternatives or fallback options. However, the Bill explicitly functions as guidance rather than binding and enforceable law (White House, 2022).

The *NIST AI Risk Management Framework* operationalises many of these ideas into a voluntary risk-management process, which is now supplemented with a dedicated generative-AI profile that highlights risks such as misinformation, security vulnerabilities, and systemic bias. The Trump administration's America's AI Action Plan places new emphasis on preventing 'ideological bias' in AI systems, promoting viewpoint diversity, and revisiting federal procurement and standards so that government-used models are aligned with these priorities.

“This creates a tension, in theory, between earlier rights-oriented ethics initiatives and a recent focus on political neutrality and open-source innovation.”

This creates a tension, in theory, between earlier rights-oriented ethics initiatives and a recent focus on political neutrality and open-source innovation. In practice, US firms navigate a mix of voluntary ethical commitments (e.g., company AI principles, industry consortia), NIST and Office of Science and Technology Policy (OSTP) guidance, and sectoral expectations from regulators, rather than a single codified ethical regime. This soft-law environment offers firms flexibility but also produces uncertainty and fragmentation in how 'responsible AI' is interpreted across sectors.

3.2 The European Union – National Direction and Key Priorities

EU AI Continent Action Plan
"Making the EU a world-class hub for AI."

MISSION

Build an 'AI continent' in which trustworthy, human-centric AI underpins competitiveness, technological sovereignty, and resilience, while protecting fundamental rights, democracy, and the rule of law.

OBJECTIVE(S)

Implement the AI Continent Action Plan (European Commission, 2025b) and the Apply AI Strategy (European Commission, 2026a) to:

- deploy AI at scale across EU economies and public services
- build EU-controlled data and compute infrastructures (AI factories and gigafactories)
- crowd in private capital via the InvestAI Facility and other instruments
- ensure effective, innovation-friendly implementation of the AI Act.

AI INDUSTRY FOCUS AREAS

Large-scale AI data and computing infrastructures; AI factories/gigafactories; generative and foundation models (GenAI4EU); European data spaces and cloud-to-edge infrastructure; AI for manufacturing, health, energy, mobility, public services, and climate.

KEY SECTORS

Healthcare and pharmaceuticals, mobility, transport and automotive, robotics, manufacturing, engineering and construction, climate and environment, energy, agri-food, defence, security and space, electronic communications and cultural, creative and media sector (European Commission, 2026b; 2026a)

The EU now organises its AI strategy around becoming an 'AI continent', with the AI Continent Action Plan (April 2025) as the central political and operational blueprint. The plan consolidates earlier initiatives and explicitly aims to make Europe a global AI leader by developing trustworthy AI technologies that enhance competitiveness while advancing democratic values. It prioritises: (1) large-scale AI data and computing infrastructures; (2) wider access to high-quality data; (3) sectoral AI deployment; (4) AI skills and talent; and (5) smooth implementation of the AI Act, supported by instruments like the AI Act Service Desk, InvestAI, and forthcoming AI Skills Academy.

Launched in October 2025, the Apply AI Strategy is positioned as the EU's overarching sectoral AI strategy. It focuses on accelerating AI adoption in key industries and public services mobilising around €1 billion from programmes such as Horizon Europe and Digital Europe, with additional co-financing encouraged from Member States and private investors (Chee and Landauro, 2025). The strategy emphasises reducing dependence on non-EU AI technologies and infrastructure, promoting an 'AI-first' mindset in industrial policy, and coordinating stakeholders through the Apply AI Alliance and an AI Observatory that tracks sectoral impacts.

Together, the AI Continent Action Plan, Apply AI Strategy, and AI Innovation Package (including its GenAI4EU initiative) convert the EU's long-standing 'excellence and trust' narrative into a deployment-oriented programme that couples strong regulation with targeted industrial and financial tools.

Regulatory frameworks

The EU AI Act remains the cornerstone of EU AI governance. It introduces a four-tier risk-based framework – unacceptable, high, limited, and minimal risk – linking regulatory obligations to the potential impact on health, safety, and fundamental rights. Unacceptable-risk practices (such as certain social-scoring and manipulative systems) are banned, high-risk systems (e.g., in critical infrastructure, employment, education, migration, law enforcement) face stringent ex-ante and post-market conformity requirements, limited-risk systems are required to meet specific transparency duties, and minimal-risk systems are largely unregulated (European Commission, 2023; ISACA, 2024).

The Act includes a dedicated regime for general-purpose and foundation models. It is also completed by the 'General-Purpose AI (GPAI) Code of Practice' which provides voluntary obligations for the private sector (European Commission, 2026c). These include transparency, safety and security, and copyright protection (Chan, 2025). Implementation is overseen by the European AI Office, which coordinates national authorities and develops guidance, codes of practice and an AI Act Service Desk to support businesses and regulators. In November 2025, as part of a Digital Simplification Package, the Commission proposed targeted amendments to the AI Act to clarify obligations and reduce administrative burdens, especially for SMEs, while reaffirming the core risk-based structure. The AI Act operates within a broader digital-regulation stack – GDPR, the Data Governance and Data Acts, the Digital Services Act, and the Digital Markets Act – so EU AI firms must navigate overlapping but increasingly coordinated frameworks for data protection, competition, and platform accountability (European Commission, 2025e).

Commercial incentives

Commercial incentives are now explicitly tied to building an 'AI continent' through de-risked investment and shared infrastructure rather than direct subsidies to individual firms alone. The AI Continent Action Plan highlights three flagship tools:

- AI Factories and Gigafactories: large-scale AI compute and data centres, built on Europe's supercomputing infrastructure, intended to support training and deployment of advanced models and sectoral applications.
- InvestAI Facility: an EU-level investment instrument designed to stimulate private investment into AI by leveraging EU budget and EIB Group financing.
- AI Skills Academy (planned): a European initiative to build AI skills pipelines across Member States, complementing existing digital-skills programmes.

These sit alongside the AI Innovation Package and its GenAI4EU initiative, which support AI start-ups and SMEs with regulatory sandboxes, privileged access to EU supercomputers, and projects in high-impact industrial ecosystems such as robotics, health, biotech, manufacturing, mobility, and virtual worlds.

The Apply AI Strategy adds a strong deployment lens: roughly €1 billion is earmarked for AI projects in healthcare, manufacturing, energy, mobility, and public administration, with explicit goals of strengthening technological independence and reducing reliance on US and Chinese AI technologies (European Commission, 2025c). For firms, this translates into substantial non-dilutive funding and access to shared infrastructure, albeit conditional on alignment with EU trust and sovereignty objectives and participation in cross-border consortia.

Ethical frameworks/guidelines

The ethical foundation of the EU's AI model remains the *Ethics Guidelines for Trustworthy AI* (2019) produced by the High-Level Expert Group on AI. These guidelines define 'trustworthy AI' as lawful, ethical, and robust; they articulate four core ethical principles: (1) respect for human autonomy, (2) prevention of harm, (3) fairness, and (4) explicability, which are operationalised through seven key requirements (e.g., human agency and oversight, technical robustness, privacy and data governance, transparency, diversity and non-discrimination, societal and environmental well-being, and accountability) (European Commission, 2019).

The EU's AI Continent Action Plan and Apply AI Strategy both reaffirm that AI development and deployment must respect EU fundamental values and rights, explicitly linking large-scale investment in AI to safeguards for democracy, rule of law, and societal well-being.

In practice, these ethical principles are no longer only soft guidance: they are increasingly embedded in binding law through the AI Act's risk-based obligations and sectoral rules, while voluntary instruments such as the AI Pact and GPAI Code of Practice encourage firms to anticipate and internalise ethical and compliance requirements ahead of legal deadlines.

For AI firms operating in the EU, 'trustworthy AI' is therefore both a normative expectation and a concrete compliance regime: adherence to ethical principles is enforced via documentation, governance, testing, and monitoring duties, and is integral to accessing EU funding, infrastructure, and public-sector markets under the AI Continent and Apply AI agendas.

3.3 China – National Direction and Key Priorities

Artificial Intelligence Plus (AI+)

"Promoting the extensive and in-depth integration of AI across various fields to accelerate the cultivation of new quality productive forces."

MISSION

Integrate AI across the whole economy and society so that by the early 2030s, AI underpins growth, governance, and national security, while strengthening technological self-reliance in compute, data, and core AI capabilities.

OBJECTIVE(S)

Achieve deep AI integration in six priority domains (science and technology, industrial development, consumption, people's wellbeing, governance, and international cooperation) by 2027;

Make AI empower China's high-quality development by 2030, with next-generation intelligent terminals and AI agents exceeding 90% penetration rate in society (Chinese State Council, 2025a).

AI INDUSTRY FOCUS AREAS

Strengthening the technical foundations of the AI ecosystem (e.g., models and algorithms, high-quality data, computing power, technical talent, and open-source platforms) while accelerating deployment in embodied AI and robotics, industrial internet, smart cities, autonomous mobility, and sector-specific large models (Schaefer and Nunlist, 2025).

KEY SECTORS

Advanced manufacturing and industrial robotics; city-level digital governance and public services; consumer internet and fintech; healthcare and biomedicine; tele-communications and cloud infrastructure; logistics and autonomous vehicles; and international cooperation through the *AI+ International Cooperation Initiative*.

China's current national AI direction is structured around the AI+ initiative, framed as the successor to 'Internet+' and the blueprint for embedding AI as the engine of 'new quality productive forces.' The 2025 State Council guideline on implementing AI+ calls for extensive and in-depth integration of AI across six core domains on an ambitious 2027/2030 timeline: (1) science and technology, (2) industrial development, (3) consumption, (4) people's wellbeing, (5) governance, and (6) global cooperation. Rather than focusing primarily on headline industry-output targets (as in the *2017 New Generation Artificial Intelligence Development Plan*), AI+ emphasises the need for within-economy AI diffusion, such as using AI to upgrade existing sectors, create new smart-economy growth engines, and reshape human-machine collaboration.

Geopolitical and associated supply-chain pressures give China's AI plans a strong sovereignty dimension. The AI+ initiative prioritises strengthening national AI capabilities as part of its ambition to be a global technological powerhouse (Huang, 2025). Additionally, national programmes such as *Eastern Data, Western Computing* and the roll-out of computing-power vouchers seek to ensure a unified, state-orchestrated AI compute network and to lower barriers for SMEs to train and deploy AI systems (Olcott, Ding and Liu, 2024; Zhang et al., 2025).

Externally, Beijing has complemented domestic AI+ with an *AI+ International Cooperation Initiative*, positioning China as a leader in promoting AI for development, especially in the Global South, and linking AI diffusion to its 'community of shared future for mankind' narrative (Chinese State Council, 2025b). The result is a strategy that combines aggressive domestic deployment, heavy state co-ordination of infrastructure and capital, and an outward-facing governance and standards diplomacy.

Regulatory frameworks

There is a comprehensive regulatory stack around AI and associated technologies. Core data and cyber-sovereignty laws such as the Cybersecurity Law, Data Security Law, and Personal Information Protection Law, impose strict requirements on data localisation, and cross-border transfers that directly shape AI training and deployment.

Commercial incentives

As China's AI industrial policy revolves around diffusion and application, financing thus lies with other state-backed funds that crowd in private capital for the development of AI and associated high-tech industries, with an estimated RMB 1 trillion investment intended over the course of the next two decades (International Federation of Robotics, 2025). For firms, this creates strong material incentives to align product roadmaps with the national AI+ priorities and to locate in regions and sectors favoured by central and provincial implementation plans. The flip side is dependence on public funding cycles and closer scrutiny from regulators and party organs.

Ethical frameworks/guidelines

China's AI ethics architecture predates its 2025 AI+ initiative. Frameworks such as *Governance Principles for a New Generation of Artificial Intelligence* and the *Ethical Norms for New Generation AI* are generally anchored around the UN Sustainable Development Goals and the vision for a 'community of shared future for mankind' (China Daily, 2019; Center for Security and Emerging Technology, 2021). The Beijing AI Principles, released in 2019, add a research-driven layer that endorses long-term development of general and superintelligent AI under reliable human control (Datenschutz und Datensicherheit, 2019).

AI+ extends these ethics outward through the *AI+ International Cooperation Initiative*, which emphasises inclusive access to AI, development benefits for the Global South, and balancing innovation with security.

3.4 United Arab Emirates

UAE Strategy for Artificial Intelligence

"The US is in a race to achieve global dominance in artificial intelligence."

MISSION

Maintain and enhance US global leadership in AI to promote human flourishing, economic competitiveness, and national security (Executive Office of the President, 2025).

OBJECTIVE

Implement a federal AI Action Plan that accelerates private-sector-led innovation, scales domestic AI infrastructure, and aligns allies around US AI technologies in order to 'win the AI race' (White House, 2025).

AI INDUSTRY FOCUS AREAS

Frontier and foundation models; large-scale cloud and compute infrastructure (including semi-conductors and energy); open-source/open-weight models; and dual-use applications in security, health, and critical infrastructure.

KEY SECTORS

Data centres; semiconductor fabrication and advanced manufacturing; energy infrastructure; biotechnology and biosecurity; scientific research (Crossan *et al.*, 2025).

The UAE's AI strategy is explicitly framed as a nation-building and competitiveness project: AI is intended to raise government performance, create new high-value markets, and position the country as a global hub for AI investment and deployment by 2031. The federal AI Strategy 2031 and the work of the UAE Artificial Intelligence Office set the overarching direction, while Abu Dhabi's Artificial Intelligence and Advanced Technology Council (AIATC) now guides policies and investment strategies for AI and frontier technologies at the emirate level (Finance Middle East, 2025).=

To operationalise this vision, the UAE is building a dense AI infrastructure and investment stack. Abu Dhabi has launched MGX, a sovereign AI investment platform targeting around USD 100 billion in global AI opportunities, backed by Mubadala and G42 (Bartenstein, 2024). Large-scale partnerships with Microsoft and G42 underpin plans for sovereign cloud systems and AI-native government operations, including a multi-year Abu Dhabi government deal aiming to create one of the first fully AI-native governments by 2027 and to process more than 11 million digital interactions per day (UAE Government, 2025). At the infrastructure layer, projects such as the 5-GW Stargate AI campus, combined with US-approved exports of tens of thousands of Nvidia's most advanced chips, are designed to give the UAE hyperscale compute capacity tightly coupled to US technology ecosystems (Maccioni, 2025; Moss, 2025).

Strategy documents and adoption guidelines emphasise that the government will act as both regulator and first mover: AI Adoption Guidelines for Government Services and sector-specific playbooks (e.g., for generative AI) are designed to position the public sector as a reference client and testbed for AI systems. Internationally, initiatives such as 'AI for Development' in Africa position the UAE as a provider of AI infrastructure and financing to the Global South, reinforcing its role as a geopolitical AI hub (PR Newswire, 2025).

Regulatory frameworks

The UAE does not yet have a dedicated AI statute; instead, AI development and deployment are shaped by a layered combination of federal law, free-zone regulations, and soft-law guidance.

The UAE has a federal data protection law (*Federal Decree-Law No. 45 of 2021 on the Protection of Personal Data*) which establishes general privacy principles, data-subject rights, controller/processor obligations, and rules on cross-border data transfers (Presidency Palace in Abu Dhab, 2021). It is administered by the UAE Data Office and applies to most onshore private-sector and federal-government processing, including AI systems trained on or using personal data.

There are also free-zone regimes with explicit AI provisions. The Dubai International Financial Centre (DIFC) maintains its own Data Protection Law and Regulations. Amendments in 2023 introduced *Regulation 10*, one of the first dedicated regulatory frameworks for 'autonomous and semi-autonomous systems' in the region, imposing specific conditions on AI-based processing of personal data and enabling certification/assurance schemes (Dubai International Finance Centre, no date).

There are also soft-laws and non-binding guidelines for AI deployment in the UAE. The AI Adoption Guidelines in Government Services and other resources help set expectations around governance structures, risk management, documentation, and lifecycle controls for AI systems used by public entities.

Overall, the UAE regulatory environment combines a relatively light, innovation-friendly baseline with targeted, high-visibility rules in finance, data protection, and media, giving authorities levers to intervene where AI intersects with privacy, security, or national reputation.

Commercial incentives

Commercial incentives for AI in the UAE are largely centred on sovereign capital, flagship partnerships, and the use of government demand to de-risk large infrastructure and platform bets. Sovereign AI investment platforms such as MGX, jointly-established by Mubadala and G42, has an estimated mandate of USD 100 billion (Bartenstein, 2024), which signals a commitment to use sovereign wealth to build and acquire strategic AI capabilities. These capabilities include compute infrastructure and data centres to labs and overseas assets.

There are also significant strategic partnerships with US technology companies. Microsoft's partnership with G42, including multi-billion-dollar investments and joint research centres in Abu Dhabi, aims to build sovereign cloud and AI infrastructure, expand low-latency datacentres via Khazna, and fund a regional developer ecosystem (Althoff, 2024; Microsoft, 2025). US-approved

exports of advanced Nvidia GPUs under strict safeguards further embed UAE AI growth in US-aligned hardware and software supply chains (AP News, 2025).

The UAE government also functions as an anchor client and accelerator for its national AI ecosystem. Abu Dhabi's digital strategy explicitly targets becoming the world's first fully 'AI-native' government by 2027, backed by billions of *dirhams* in digital-infrastructure investments and more than 800 AI-powered public-service solutions via its TAMM platform (Department of Government Enablement, no date). Education and training institutions such as the Technology Innovation Institute (TII) and the Mohamed bin Zayed University of Artificial Intelligence (MBZUAI) further complement this ecosystem by producing research talent and open models (e.g., Falcon), which function both as public goods and as signalling mechanisms for the UAE's AI ambitions.

Ethical frameworks/guidelines

The UAE has built a soft-law ethics layer that is increasingly being tied to practical guidance and, in some zones, enforceable requirements. The UAE AI Office's ethics document sets out high-level principles and detailed organisational guidelines for responsibility at the national level, covering topics such as transparency, fairness, accountability, privacy, human oversight, and safety – intended to guide both public- and private-sector AI deployments. This is supported by other instruments such as non-binding guidelines and toolkits that steer AI adoption, Generative AI, and AI Maturity Self-Assessment. Together, the UAE has an ethics environment that is strongly advisory at the federal level but already quasi-mandatory in key financial and media domains.

4. DEPENDENCY NETWORKS IN THE AI SUPPLY CHAIN

4.1 Compute Infrastructure

AI Supply Chain Dependency Map: Compute Infrastructure

Compute infrastructure is a central chokepoint in the AI supply chain. Advanced accelerators (GPUs and other AI chips), access to leading-edge fabrication, and large-scale cloud/data centre capacity are heavily concentrated and embedded in export-control regimes. Across our four cases, this produces asymmetric patterns of control (ability to set terms or restrict access to compute) and dependency (reliance on external chips, fabs, or cloud operators).

We summarise chip/accelerator availability, export-control exposure, local capabilities, and infrastructure vendors in each country, focusing on the overall dependency structure rather than technical detail.

US

Control	Dependency
High - Designs most frontier accelerators; sets export rules on chips and tools.	**Medium** - Relies on offshore fabs and global inputs, but domestic firms are first in line for advanced hardware.

Current Capabilities

Chip and accelerator availability

The US sits at the centre of the global AI hardware stack. Nvidia and AMD, both US-based, design the dominant data-centre AI accelerators (e.g., A100, H100, H200, Blackwell GB200/GB300 series and AMD's MI300 line). These parts underpin most frontier model training worldwide. US hyperscalers (AWS, Microsoft Azure, Google Cloud) operate massive GPU and custom-accelerator clusters that are directly available to domestic firms and, where permitted, to foreign users.

While some fabrication is located in the US, a large share of leading-edge production for these chips remains offshore at TSMC (Taiwan) and Samsung (South Korea), embedding the US in globalised manufacturing networks (NVIDIA, 2024).

Local capabilities and infrastructure vendors

- Design: Home to Nvidia, AMD, and multiple custom-ASIC efforts by hyperscalers.
- Cloud/data centres: AWS, Azure, and Google Cloud dominate high-end AI cloud provision.

Dependency Structure

Export-control and exposure

Washington has used export controls as a primary tool of tech statecraft. Since 2022, successive rounds of rules have restricted exports of advanced AI chips (A100, H100, Blackwell and equivalents) and high-end chipmaking equipment to China and other 'countries of concern.' These controls are performance-based and apply extraterritorially to chips manufactured abroad with US technology ('foreign direct product' rules), giving the US outsized regulatory leverage over who can access frontier compute (Industry and Security Bureau, 2022).

At the same time, US AI leadership remains materially dependent in the semiconductor supply chain, especially Taiwan's TSMC for leading-edge fabrication and the Netherlands' ASML for extreme ultraviolet (EUV) lithography systems, meaning that its own frontier compute base is still reliant on allied foreign industrial chokepoints (O'Grady and Kenyon, 2023; Mickle, 2026).

The US is therefore exposed to supply-chain risks in fabrication and materials, but is a controller, not target, of export restrictions in AI hardware.

Recent Policy Trends

Industrial policy (e.g., CHIPS-style subsidies) seeks to reshore more manufacturing and secure capacity with allied fabs.

China

Control	Dependency
Low in global terms - little ability to dictate others' access to compute; constrained by foreign controls on tools and chips.	**High** - on foreign equipment, EDA tools, and (until recently) US GPUs, with a push toward domestic substitution under significant constraints.

Current Capabilities

Chip and accelerator availability

Before US controls tightened, Nvidia held an estimated ~95% share of China's data-centre AI accelerator market (Mo and Potkin, 2025); by late 2025, Nvidia's CEO acknowledged that share had fallen to 'zero' due to export restrictions (Baptista and Park, 2025). In response, Beijing has accelerated support for domestic AI chips:

- Huawei's Ascend series and chips from Biren, Cambricon, Moore Threads and others are being positioned as substitutes for Nvidia/AMD GPUs in data-centre workloads (Potkin and Pan, 2025).
- Major AI labs such as DeepSeek, ByteDance and Ant Group have begun experimenting with or adopting Ascend 910B/910C chips for training and inference, though ecosystem and performance gaps remain (Reuters, 2024).

China has large data-centre build-outs and significant capacity at mature process nodes but is constrained at the leading edge by restrictions on importing high-end manufacturing tools.

Local capabilities and infrastructure vendors

- Design: Rapidly growing domestic accelerator ecosystem (Huawei, Biren, etc.) backed by large state funding.
- Fabs: Strong at mature nodes; limited at leading-edge nodes due to equipment restrictions.
- Cloud/data centres: Large national cloud providers (Alibaba Cloud, Tencent Cloud, Huawei Cloud, etc.) operate sizable AI clusters, increasingly stocked with domestic accelerators.

Dependency Structure

Export-control and exposure

China is the primary target of US-led export control regimes on:

- Advanced AI chips (A100/H100/Blackwell-class GPUs, equivalent accelerators).
- High-end lithography and other semiconductor equipment, where Dutch and other European controls (often shaped by US pressure) constrain ASML's most advanced tool exports to China (Olcott, 2025).

Recent Policy Trends

Recent Chinese policy moves reportedly go further by banning or heavily discouraging foreign AI chips in certain national projects, requiring domestic accelerators in new government-backed data centres and offering subsidies for their use - a retaliatory step that also aims to build up China's domestic ecosystem (Reuters, 2025a).

EU

Control	Dependency
Medium but indirect - significant leverage via lithography tools and regulatory power.	**High** - imports US GPUs and depends heavily on US hyperscalers for frontier AI compute.

Current Capabilities

Chip and accelerator availability

The EU has limited presence in frontier AI accelerators but plays a pivotal role in the upstream tool stack. ASML, based in the Netherlands, is the world's only supplier of extreme ultraviolet (EUV) lithography machines and a major supplier of advanced deep ultraviolet (DUV) tools, both critical for producing leading-edge chips.

For AI workloads, European firms predominantly rely on US-designed GPUs and cloud offerings. Domestic and regional cloud providers exist, but AWS, Azure, and Google Cloud still dominate high-end AI compute in most member states (Market Data Forecast, 2026).

Local capabilities and infrastructure vendors

- Tooling: ASML and associated suppliers confer real structural weight in the chipmaking tool stack.
- Cloud/data centres: Mix of national providers and EU 'sovereign cloud' initiatives, but US hyperscalers remain the primary providers of large-scale AI training compute.

Dependency Structure

Export-control and exposure

The EU participates in export controls primarily through:

- Dutch licensing restrictions on ASML tool exports to China and other destinations, coordinated with the US and Japan.
- EU-level tightening of dual-use export lists for advanced semiconductor manufacturing and testing equipment (European Commission, 2025a).

This gives the EU some leverage over China and other importers of lithography tools, but it is itself constrained by US-origin controls that dictate what European firms may sell and what European researchers can access (e.g., when US export rules apply to US-origin chips used in Europe).

Recent Policy Trends

The EU Chips Act and broader 'digital sovereignty' agenda aim to expand domestic manufacturing and reduce dependence on non-EU cloud/compute, but these are long-term projects (European Union, 2022).

UAE

Control	Dependency
Very low - no leverage over chip supply beyond financial and diplomatic bargaining power.	**Very high** - entirely reliant on imported US-origin accelerators and foreign cloud/infrastructure operators, albeit with privileged access negotiated through strategic partnerships.

Current Capabilities

Chip and accelerator availability

The UAE does not design or manufacture AI chips. Its strategy is to import compute at scale and host it locally:

- Microsoft has announced a US$15.2 billion investment programme in the UAE (2023–2029) focused on AI and cloud infrastructure, including large data-centre expansions (Smith, 2025).
- As part of this partnership and a broader bilateral deal, Microsoft has secured US Commerce Department licences to export tens of thousands of advanced Nvidia AI chips – including GB300 Grace Blackwell systems – to UAE-based data centres (AP News, 2025).

In parallel, the Stargate UAE project – led by G42 and backed by Nvidia, Oracle, Cisco, SoftBank and OpenAI – is planning a 1 GW-scale compute cluster using Grace Blackwell GB300 systems, marketed as one of the largest AI clusters outside the US.

Local capabilities and infrastructure vendors

- No domestic chip design or fabrication; all accelerators are imported.
- AI/cloud infrastructure anchored by G42 and its subsidiaries, in partnership with Microsoft Azure and other US/allied vendors (Althoff, 2024).

Dependency Structure

Export-control and exposure

The UAE sits in a delicate position:

- It was initially swept into tightened US export-control categories (grouped with other Gulf states), meaning that high-end AI chips require licences and are not automatically available.
- Recent deals show that access is possible but **politically conditional**: large chip shipments and cluster projects proceed only under strict US-approved arrangements and in exchange for major Emirati investment in US sectors (Freifeld and Sayegh, 2025).

This makes the UAE highly exposed to any future shifts in US export policy or in the political relationship more broadly.

Recent Policy Trends

The UAE is highly exposed to any future shifts in US export policy and the broader US-UAE relationship.

4.2 Finance

AI Supply Chain Dependency Map: Finance

Large-scale AI development depends on sustained access to capital for long-term R&D, infrastructure investment, and firm scaling, yet financial resources are distributed asymmetrically across global markets. Across our four cases, this generates distinct patterns of financial control (the ability of states to channel, condition, or restrict capital flows into AI-related activities,) and dependency (reliance on external funding sources, foreign investors, or public subsidies to sustain growth and competitiveness).

We focus on the structural configuration of financial dependence and autonomy within national AI ecosystems.

US

Control	Dependency
High - Restricts foreign investment in domestic AI-related sectors; US private firms are investors in AI industries abroad.	**Low** - Domestic financial support is diversified and sufficient.

Current Capabilities

The US finances AI development through a diversified capital structure that combines federal spending, private-sector investment, and state-level and philanthropic funding.

Federal government

The US federal government commits several billion dollars each year for AI research and enabling infrastructure. This support is distributed primarily through the National Science Foundation (NSF) and the Networking and Information Technology Research and Development (NITRD) program, alongside compute-focused industrial initiatives under the CHIPS and Science Act. Beyond civilian programmes, the investment also flows through defence-oriented AI programmes supported by the Department of Defense and intelligence agencies.

Private sector

The private sector is the dominant force. Venture capital, private equity, and big techs far exceed public investment. In 2024, private AI investment in the US reached US$109.1 billion – nearly 12 times China's US$9.3 billion and 24 times the UK's US$4.5 billion (Stanford Institute for Human-Centered Artificial Intelligence, 2025).

State government and philanthropy

State governments promote local AI development by offering tax incentives and subsidies for data-centre construction, while philanthropic foundations and universities provide smaller but targeted streams of funding for specific AI initiatives.

Dependency Structure

Export-control and exposure

The US AI ecosystem is not heavily dependent on foreign capital. At the same time, the federal government has strengthened the review of inbound foreign investment and has also imposed restrictions on US capital flowing into foreign companies deemed to pose potential national-security risks (Mills, 2025).

Recent Policy Trends

Although federal allocations for AI are expected to grow steadily, they remain considerably below the scale of investment implied by prevailing 'AI arms-race' narratives. For example, the National Security Commission on Artificial Intelligence (NSCAI) recommended increasing federal funding for non-defence AI R&D at compounding levels, doubling annually to reach US$32 billion per year by FY2026 (Borges and Deng, 2025). However, the US has fallen far short of this goal: in FY2025, the federal government invested about US$3.3 billion in non-defence AI R&D.

Private-sector investment continues to dominate, powering advances in frontier-model development and large-scale data-centre expansion.

Geopolitical tensions have prompted the US to tighten oversight of both outbound capital flows and inbound investments into its AI sector, with especially stringent scrutiny applied to transactions involving China.

China

Control	Dependency
Low - Geopolitical tensions and investment screening limit the scale and depth of overseas capital engagement in foreign AI ecosystems.	**Low** - AI development is driven primarily by domestic capital, with foreign funding playing a supplementary role.

Current Capabilities

China's AI investment model is characterised by strong state leadership, a multi-tiered guidance-fund system, and the coordinated participation of public and market capital.

Fiscal expenditures

Central-budget allocations for major science and technology programmes and key R&D initiatives, as well as local government support via industrial funds, subsidies, and preferential tax policies. Recent estimates suggest that the Chinese government spent US$133 billion on AI-related R&D and industrial support over 2019-2023 (Liberto, 2025).

Government-guided funds

These national and local funds function as the core investment mechanism, leveraging public capital to attract substantial private investment. In April 2025, China announced further details of a RMB 60 billion (US$8.2 billion) state fund designed to finance early-stage AI projects (Cao, 2025).

State-owned enterprises and policy banks

Central and local SOEs invest in compute capacity, cloud platforms, and data centres, while institutions such as the China Development Bank provide loans and dedicated credit lines for AI-related projects. For example, the Bank of China has announced a five-year programme providing at least RMB 1 trillion (US$138 billion) in integrated financial support for the AI industry chain.

Capital-market financing

Market capital comprises corporate R&D and VC and PE investment in AI start-ups. China's private AI investment reached roughly US$9.3 billion in 2024 (Stanford Institute for Human-Centered Artificial Intelligence, 2025)

Dependency Structure

China's AI development is driven primarily by domestic capital. Although US, European, and Middle Eastern investors have participated in the Chinese AI ecosystem in recent years, their involvement has remained supplementary.

Recent Policy Trends

With investor sentiment among international actors recovering and China increasingly recognising the value of foreign capital, Beijing seeks to pursue a balanced approach between welcoming selected foreign capital and moving toward stricter foreign-investment controls.

China's AI development plans set industry output targets upfront and then align fiscal spending, guidance funds, and credit tools to achieve them. This produces a flexible, dynamic funding structure that extends beyond conventional R&D allocation mechanisms.

EU

Control	Dependency
Medium - the EU does not possess a unique or non-substitutable financial bottleneck that other countries must rely on for AI development.	**Mediun** - AI development is largely financed by EU-based public and private capital, but external investors remain important for scaling frontier firms and capital-intensive infrastructure.

Current Capabilities

The EU relies on a mixed funding model combining EU-level public investment instruments and growing but still limited private-sector capital.

Public funding

Public funding forms the backbone. Through Horizon Europe and Digital Europe programmes, the Commission commits at least €1 billion (US$1.15billion) per year in AI and aims to leverage an annual investment volume of €20 billion (US$23 billion) from the private sector and EU member states (European Commission, 2025d).

Private investment

Private investment reached approximately US$19.4 billion in 2024 across Europe (including both the EU and the UK), with a notable surge driven by European firms like Mistral (Stanford Institute for Human-Centered Artificial Intelligence, 2025).

EU member states

Member states contribute substantial national-level investment to bolster domestic AI capacity. For instance, France has committed large-scale funding to frontier AI research, high-performance computing, and national model development, while Germany has increased public support for AI research and industry adoption as part of its broader digital strategy.

Dependency Structure

The development of AI within the EU is financed primarily through EU-based capital. Nonetheless, the region maintains a meaningful degree of foreign participation. Middle East sovereign wealth funds, for example, play a supplementary role in financing European AI companies and large-scale infrastructure projects (Martin, 2025).

Recent Policy Trends

The EU Chips Act and broader ‘digital sovereignty’ agenda aim to expand domestic manufacturing and reduce dependence on non-EU cloud/compute, but these are long-term projects.

UAE

Control	Dependency
Medium - The UAE wields sizable, discretionary sovereign capital and is a major outbound AI investor, giving it leverage over selected projects and partnerships abroad.	**Low** - limited reliance on foreign financing.

Current Capabilities

The UAE positions AI as a core pillar of economic transformation and finances AI development through a sovereign-capital-driven model.

Government allocations and sovereign wealth funds

The UAE has committed over US$150 billion to AI development through 2031 (SOO Group, 2025b). As part of this broader strategy, MGX, established in 2024 by the Abu Dhabi government, aims to manage assets of up to US$100 billion (Innovation Library, 2025).

Private-sector investments from leading local enterprises

Emirati business groups, such as Al-Futtaim and Al Ghurair, have deployed significant capital into AI-driven sectors including smart cities and autonomous systems (Al-Futtaim, 2026).

Venture capital

Venture capital attracted by UAE's innovation platforms like Hub71, whose start-ups had raised more than US$2 billion in total funding by 2024 (Hub71, 2025).

Dependency Structure

The UAE is a net capital exporter that uses outbound AI and technology investment as a strategic tool to embed itself within the global AI landscape.

Recent Policy Trends

The UAE is expected to shift from relying mainly on outward sovereign investment to attracting joint investment that supports domestic AI capacity-building.

Despite its substantial commitments to US AI development, the UAE has adopted a cautious stance toward China, maintaining engagement without full alignment. This dual strategy underscores Abu Dhabi's attempt to maximise its strategic autonomy and leverage geopolitical dynamics to its advantage.

4.3 Talent

AI Supply Chain Dependency Map: Talent

One of the crucial dimensions shaping the trajectory of AI competition is the capacity to cultivate, attract, and retain top-tier human talent. In this section, we assess the situation of AI researchers and scientists in the US, China, the EU, and the UAE.

Across our four cases, this produces distinct patterns of talent control (the ability of states to attract, retain, regulate, or restrict the movement of AI professionals) and dependency (reliance on foreign-trained experts, cross-border mobility, or international collaboration to sustain AI innovation and capacity building).

US

Control	Dependency
High - Dominant AI ecosystem and visa regimes enable selective attraction and restriction of global AI talent.	**High** - AI research and innovation depend heavily on foreign-born and foreign-trained professionals.

Current Capabilities

Although this share has declined – from 59% in 2019 to 42% in 2022 – the US remains the leading destination for the world's top AI researchers (Long, 2025). Of all leading AI researchers in the US, 70% were foreign-born or foreign-educated. The most common places of origin were China, India, and the UK (Abdulla and Chahal, 2023). This shows that the US AI ecosystem depends heavily on international talent.

Dependency Structure

Domestic level

US universities train large numbers of AI specialists. Many PhD graduates go on to work in American big techs, research labs, or start their own AI companies, creating a strong link between academia and industry.

International level

Students who study AI-related subjects in the US can use the F-1 visa and OPT for STEM fields to stay after graduation. Senior AI experts often apply through O-1A or EB-1/EB-2 NIW routes (U.S. Department of Homeland Security, 2025).

Recent Policy Trends

The US provides easier immigration pathways for AI (or broadly STEM) workers through visa policies. Additionally, it also imposes stricter security checks on researchers from certain countries, especially China, through export-control rules, visa screening, and compliance requirements for sensitive AI technologies.

China

Control	Dependency
Medium - Strong domestic training capacity and regulatory oversight shape talent flows.	**Medium** - Predominantly domestically trained talent, with selective reliance on overseas expertise and collaboration.

Current Capabilities

China is one of the most important source countries for top AI talent. Among the top AI research institutions in the US, 38% of the talent comes from China – slightly higher than the 37% from the US itself (Hundun Academy, 2025). Also, a significant share of China-trained researchers eventually stays and works domestically due to rapid development of the Chinese AI industry.

Dependency Structure

Domestic level

Under the New Generation AI Development Plan, China makes the construction of a high-end talent team of the utmost importance in the development of AI (Webster et al., 2017). China's AI ecosystem operates under a dual model of state guidance and market orientation. It is supported by top universities and research institutes, major technology firms, and national key laboratories.

International level

China promotes high-level talent programmes, project-based cooperation, flexible employment, and partnerships with top global AI institutions to attract overseas scientists.

Recent Policy Trends

China's rules on data security and cybersecurity (e.g., Data Security Law, Personal Information Protection Law) create strict requirements for both domestic and international researchers working with sensitive data in the field of AI. Political and security reviews have also increased for foreign collaborations and dual-appointments.

EU

Control	Dependency
Medium - Provides funding and coordination but lacks strong control over global AI talent flows.	**Medium** - Relies heavily on cross-border talent and US-led AI companies operating in Europe.

Current Capabilities

AI talent in Europe is concentrated in a few European countries such as Germany, France, the UK, and Switzerland. Many top researchers ultimately work for US companies operating in Europe.

Dependency Structure

Most EU member states have their own national AI strategies, research universities, and AI competence centres to train and attract AI talent. At the EU level, initiatives such as the AI Skills Academy, Horizon Europe and Digital Europe provide funding for AI PhD networks and industry PhD programmes.

Recent Policy Trends

Some member states offer fast-track visas and tax incentives for AI professionals. At the same time, companies and research institutions must follow the AI Act, GDPR, and other regulatory frameworks. These rules impose compliance and ethical requirements, especially in sensitive areas, but they target institutions and systems, not individual researchers.

UAE

Control	Dependency
Low - No structural control over global AI talent mobility.	**High** - Heavy reliance on imported AI expertise.

Current Capabilities

The Middle East produces only a small share of top AI researchers, but the UAE and Saudi Arabia have become increasingly attractive destinations for AI professionals.

Dependency Structure

The UAE partners with Google, Microsoft, Amazon, Nvidia, and others, aiming to train and attract 100,000 programmers within five years and build 1,000 digital companies. In 2025, the UAE also launched the '1 Million AI Talents' programmes (SOO Group, 2025a).

Recent Policy Trends

Provide Golden Visa (10-year residency) for the world's top AI experts. Fast-track work permits for AI and digital professionals; Government-funded training programmes; and Subsidies for AI companies (Department of Economic Development, 2026).

The UAE maintains strong regulation over national security, data governance, and cybersecurity. However, publicly available information suggests a 'soft regulation + sandbox' approach designed to attract experimental AI projects, rather than strict limits on individual researchers (UAE Government, 2024).

4.4 Summary Table – AI Supply Chain Control-Dependency Matrix

		US	China	EU	UAE
Compute Infrastructure	Control	High	Low	Medium	Very Low
	Dependency	Medium	High	High	Very High
Finance	Control	High	Low	Medium	Medium
	Dependency	Low	Low	Medium	Low
Talent	Control	High	Medium	Medium	Low
	Dependency	High	Medium	Medium	High

The matrix highlights a highly asymmetric distribution of control and dependency across the AI supply chain.

US: Multi-Pillar Bottleneck Controller. The US exercises strong control across all three AI supply chain pillars, while remaining reliant on international resources, particularly foreign-born AI researchers, to sustain its leadership.

China: Constrained Self-Reliant Challenger. China has developed relatively endogenous support structures in finance and talent, but faces external bottlenecks in critical compute capabilities, leading to a development pattern-orientated toward self-reliance but limited by structural constraints.

EU: Regulatory and Coordinative Actor. The EU possesses medium-level capabilities across multiple domains and compensates for limited control in any single pillar through its leadership in robust regulation and investment facilitation efforts, although it remains reliant on other ecosystems.

UAE: Capital-Driven Strategic Embedder. UAE embeds itself in the global AI system through sovereign capital strategies but remains highly dependent on external resources for critical compute resources and talent.

5. POLICY INSIGHTS AND RECOMMENDATIONS

Policy Insight 1: The US–China duopoly is concentrated at the AI frontier, not across the wider AI supply chain.

AI power is functionally disaggregated. Although the United States and China currently dominate frontier-model development and are likely to remain the principal frontier powers, influence over the wider political economy of AI is distributed across actors that control or shape particular functions, including: semiconductor manufacturing equipment, regulatory and market access, capital, talent and deployment capacity.

The report illustrates this differentiated geography of power. The US controls leading accelerator design and possesses powerful export-control levers, but remains dependent on an international semiconductor production network. The EU lacks comparable frontier-model and accelerator capabilities but possesses indirect chokepoint leverage through advanced lithography, alongside substantial regulatory and market power. The UAE can use sovereign capital, infrastructure investment and strategic partnerships to negotiate privileged access to foreign technology. China, meanwhile, has responded to external constraints by accelerating domestic substitution, although important performance and ecosystem gaps remain.

Recommendation 1: Governments should not benchmark their national strategies against a single composite measure of AI leadership. Rather, policymakers should identify specific functions within the AI supply chain where they can establish durable influence and the policy instruments needed to sustain it.

Policy Insight 2: For the AI supply chain, control is networked rather than wholly national.

Even where a country appears to possess substantial control over a critical AI input, that control frequently depends on transnational production networks, allied governments and multinational firms. US influence over advanced compute, for example, rests on a coalition-based system involving US chip designers and cloud providers, leading-edge fabrication in Taiwan and South Korea, Dutch lithography equipment, and additional equipment, materials and components supplied by firms across allied jurisdictions.

Control should therefore not be understood solely as ownership of capabilities located within national territory. It may arise from jurisdiction over strategically important firms, possession of a difficult-to-replicate chokepoint, coordination with allies, or the ability to enforce restrictions across an international network.

Recommendation 2: Policymakers should treat alliance management and economic-security coordination as core AI capabilities. Governments should assess each critical input along two dimensions:

1. Mode of control: whether control is unilateral, coalition-dependent, or mediated through private firms.
2. Durability of control: whether the advantage they possess is persistent, contestable, or temporary.

Technology partnerships should include practical arrangements for licensing coordination, supply assurance, information sharing, crisis allocation, joint investment and contingency planning.

Policy Insight 3: 'AI sovereignty' is about having options within key areas of the AI supply chain, rather than full-stack autarky.

Although dependency involves reliance on external inputs, certain dependencies can be more manageable than others. For example, while the UAE's compute dependence remains extremely high, it has managed to utilise its diplomatic relationships and sovereign capital into compute infrastructure access. AI sovereignty should therefore be assessed in terms of the options available to a country: whether it can maintain access to critical capabilities, switch suppliers or partners, govern sensitive systems, and reject politically unacceptable conditions. It should not be equated with domestic ownership of every layer of the AI value chain.

Although the idea of technological self-sufficiency might appear reassuring, attempting to reproduce the full technological capabilities of the United States or China would be prohibitively expensive for most countries. It could also produce inferior capabilities, slow AI adoption and create new domestic single points of failure.

Recommendation 3: Governments should exercise their agency in the pursuit of greater strategic autonomy by converting concentrated and opaque dependencies into diversified, governable and substitutable relationships. This means turning dependencies into managed dependencies: avoiding single points of failure and ensuring that dependence does not inadvertently become a source of coercive leverage. The pursuit of AI sovereignty is therefore seeking the ability to manage interdependence on terms compatible with the national interest. ■

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