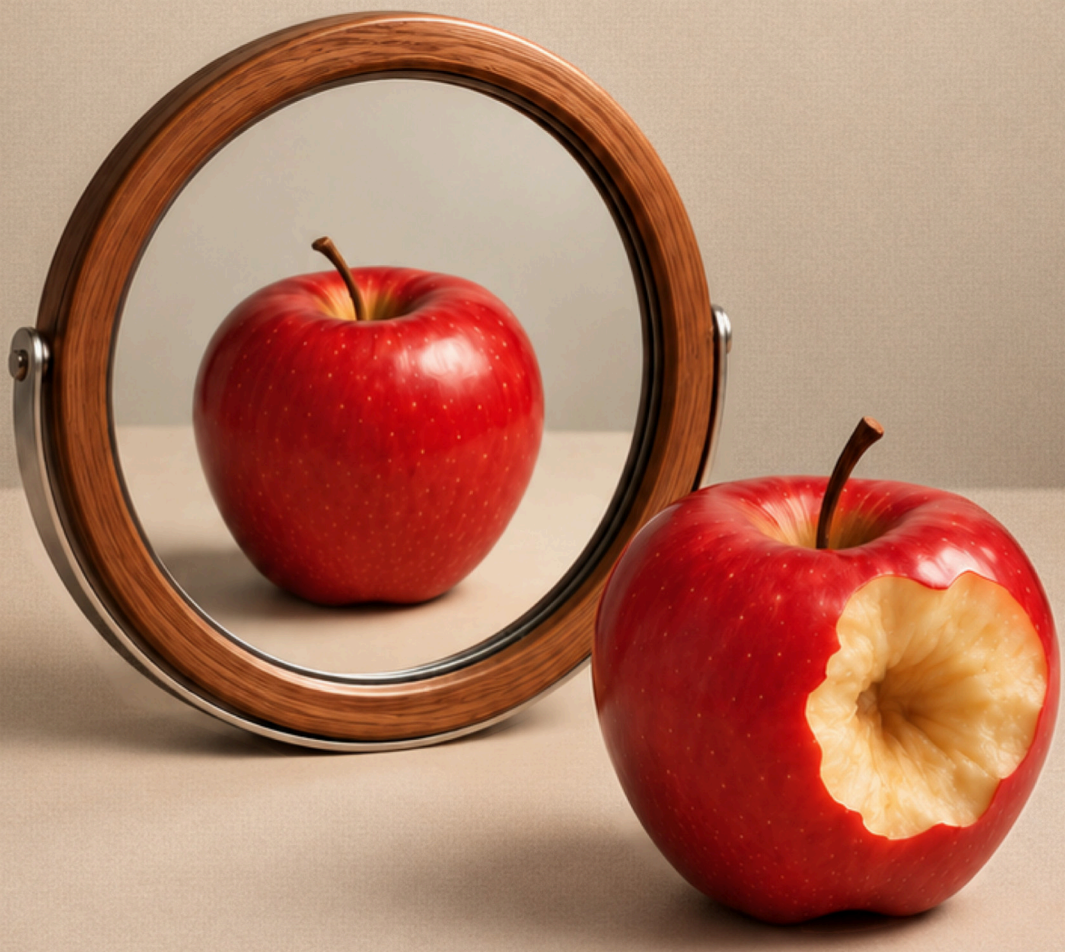
Should Governments Slow Investing in AI?

Building capability without underwriting the boom



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AL HABTOOR RESEARCH CENTRE

SHOULD GOVERNMENTS SLOW INVESTING IN AI?

Building capability without underwriting the boom

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Al Habtoor Research Centre seeks to be a leading centre of excellence in political and economic studies and early warning in the region. Our vision is to advance evidence-based policy and informed decision-making that supports sustainable development, strengthens institutions, and reinforces regional peace and stability. We are committed to offering innovative solutions to the region's most pressing challenges through research, analysis and dialogue.

Al Habtoor Research Centre
Dubai

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Executive summary

Key Findings

1. Reliable public services, cyber defence, scientific capacity and work in national languages give governments reasons to invest through a financial correction. These objectives call for different instruments and evaluation standards from a foreign model-company stake.

2. Worldwide spending forecasts cover public and private buyers. Corporate pledges, contract ceilings and sovereign-project announcements describe different obligations; treating them as public expenditure overstates investment and distorts comparisons involving the Arabian Gulf.

3. The capture hypothesis yields four judgements. Lobbying is documented with high confidence, supported by company proposals and document-based reporting. Entry-cost advantages are plausible with moderate confidence because their incidence is unmeasured. Intent to suppress rivals or fabricate warnings is unestablished. Achieved sector-wide exclusion is also unestablished: open-weight releases continue, though marginal compliance harm remains unmeasured.

4. Technology booms left networks, skills and industries after severe investor losses. Later users and owners often received the benefits. In AI, adaptable facilities and trained teams have different replacement needs from accelerators and model products; the assets acquired will determine what survives.

5. Rising capital spending, private valuations and interlocking finance create substantial, uneven risk. Established cloud cash flows and commercial demand argue against a blanket bubble diagnosis. Weaker revenue, lower utilisation and tighter funding are useful stress tests; a forecast crash date is not needed.

6. Continue competing, but change the composition and staging of public investment. Prioritise domestic know-how, Arabic data, research and usable infrastructure. Apply financial and transfer tests to foreign stakes and long compute commitments. Separately, pause or condition development and deployment when severe safety risks cannot be kept below defined thresholds.

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List of Abbreviations

AHRC — Al Habtoor Research Centre
AI — Artificial intelligence
AIP — AI Infrastructure Partnership
AMD — Advanced Micro Devices
AWS — Amazon Web Services
BBC — British Broadcasting Corporation
BIS — Bureau of Industry and Security
bn — Billion
C$ — Canadian dollar
CDMA — Code division multiple access
CNAS — Center for a New American Security
CNBC — Consumer News and Business Channel
CY — Calendar year
CY2026 — Calendar year 2026
DoD — US Department of Defense
ECOMPCTSA — E-Commerce Retail Sales as a Percent of Total Sales, seasonally adjusted
ECOMSA — E-Commerce Retail Sales, seasonally adjusted
ETRI — Electronics and Telecommunications Research Institute
EU — European Union
E.U. — European Union
FCC — Federal Communications Commission
FRED — Federal Reserve Economic Data
FY — Fiscal year
FY2025 — Fiscal year 2025
FY2026 — Fiscal year 2026
GAO — Government Accountability Office
GDP — Gross domestic product
GDPA — Gross Domestic Product, annual series
GIP — Global Infrastructure Partners
GPT — Generative pre-trained transformer
GPU — Graphics processing unit
GW — Gigawatt
H1 — First half of the year
HBKU — Hamad Bin Khalifa University
HE — His Excellency
IBM — International Business Machines
IEEE — Institute of Electrical and Electronics Engineers
IMF — International Monetary Fund
IT — Information technology
ITRI — Industrial Technology Research Institute
JPY — Japanese yen
LLM — Large language model
MBZUAI — Mohamed bin Zayed University of Artificial Intelligence
MCI — Microwave Communications Incorporated
MPRA — Munich Personal RePEc Archive
MW — Megawatt
NASDAQ — National Association of Securities Dealers Automated Quotations
NASDAQCOM — NASDAQ Composite Index
NRF — National Research Foundation
NSF — National Science Foundation
NYC — New York City
OECD — Organisation for Economic Co-operation and Development
OSTP — Office of Science and Technology Policy
PIF — Public Investment Fund
p. — Page
pp. — Pages
PRC — People's Republic of China
Q1 — First quarter
Q2 — Second quarter
Q3 — Third quarter
Q4 — Fourth quarter
QIA — Qatar Investment Authority
R&D — Research and development
RCA — Radio Corporation of America
RePEc — Research Papers in Economics
RIE2025 — Research, Innovation and Enterprise 2025
RIE2030 — Research, Innovation and Enterprise 2030
S$ — Singapore dollar
SB — Senate bill
SB53 — Senate Bill 53
SDAIA — Saudi Data and Artificial Intelligence Authority
SVF1 — SoftBank Vision Fund 1
SVF2 — SoftBank Vision Fund 2
TII — Technology Innovation Institute
TSMC — Taiwan Semiconductor Manufacturing Company
UAE — United Arab Emirates
UC — University of California
UK — United Kingdom
UMC — United Microelectronics Corporation
UN — United Nations
URL — Uniform resource locator
US — United States
US$ — US dollar
USTelecom — United States Telecom Association
WAM — Wakalat Anba'a al-Emarat (Emirates News Agency)
n.d. — No date

Glossary

Accelerator:
Specialised computing hardware used to speed up workloads such as model training and inference. Its useful service life depends on performance, costs and workloads; depreciation schedules record an accounting estimate.

AI Diffusion rule:
The January 2025 US framework that attempted to organise international access to advanced computing and certain AI technology through differentiated country arrangements. In May 2025, the Commerce Department announced its rescission and instructed officials not to enforce it, while describing formal rescission and replacement as subsequent steps.

Bubble triangle:
Quinn and Turner's framework of marketability, money or credit, and speculation, with technological change or policy potentially providing the spark. It identifies conditions that can support a bubble rather than a numerical test that proves one exists.

Capital call:
A demand for an investor to provide money under an existing commitment. In partly paid railway shares, calls could require further payment after the initial purchase.

Committed capital:
Funds pledged under an investment arrangement, distinguished from money already paid in. A fund's total commitments do not disclose each investor's contribution or the timing of payments.

Compute:
Processing resources used to train or operate AI systems. Access depends on hardware, software, energy and the legal and contractual terms under which resources can be used.

Contract ceiling:
The maximum potential value of a contract, including options where applicable. It is distinct from recorded obligations and cash disbursements.

Coxon-Bubble Paradox:
This study's label for the coexistence of insider warnings about AI danger and large capital inflows into the industry. Safety warnings and investment decisions concern different risks and can coexist for several reasons.

Dark fibre:
Installed optical-fibre strands that are not carrying an active optical signal. They may be unused, redundant or reserved for future service; their inactivity alone does not establish their economic value.

Drawdown:
The decline from a specified price peak to a subsequent trough, calculated as one minus trough divided by peak. It is a price measure and does not by itself capture dividends, capital calls or an investor's total return.

Export controls:
Legal restrictions on transfers of specified goods, software or technology, and on certain related activities. Their application can depend on the destination, recipient, end use and licensing conditions.

Fibre-mile:
One mile of an individual optical-fibre strand. A cable containing several strands therefore has more fibre-miles than route miles.

Finance lease:
A lease classified as financing an asset's use under the applicable accounting rules. Company capital-spending guidance can include repayment of lease principal, making it different from a measure limited to cash purchases of property and equipment.

Frontier model:
An AI model near the leading edge of capabilities at a given time. The thresholds used to regulate developers or training runs vary by policy instrument.

Hyperscaler:
An operator of very large cloud-computing infrastructure. Whole-company capital expenditure by such firms includes assets and activities beyond AI alone.

Installation and deployment periods:
In Perez's framework, installation is the financially led build-out of a technological revolution, while deployment involves its wider productive use. Perez emphasises the institutional changes involved in that transition.

Limited partner:
An investor in a fund whose investment is managed by the fund's general partner under agreed terms. Its net return depends on paid-in capital, distributions, fees and contractual terms, not just changes in the fund's gross asset values.

Obligation:
A recorded commitment of public funds under a legally binding arrangement. An obligation is distinct from a contract's potential maximum value and from a payment already made.

Open source:
A description involving licensing and access to development materials needed to study, modify and share a system. For AI, the release of downloadable weights alone does not settle whether a system meets an open-source definition.

Open weights:
Model parameters made available for download. The permissions to inspect, adapt, use or redistribute them depend on the accompanying terms; release of weights does not itself provide all training data or development materials.

Post-money valuation:
The equity value assigned to a company immediately after a financing round, including the new investment. It is a funding-event price under particular terms, not a continuously traded market capitalisation.

Regulatory capture:
The shaping of regulation to favour regulated interests over the public purpose of the rules. Compliance requirements that advantage incumbents provide a possible mechanism, but lobbying alone does not establish intent, insincerity or achieved exclusion.

Run-rate revenue:
Revenue over a short interval expressed at an annual pace. It does not establish full-year revenue or the revenue and margin that will be achieved over the following year.

Security dilemma:
A situation in which measures taken by one state to increase its security can make others feel less secure and encourage reciprocal accumulation. In AI, computing and software can support both civilian and military uses, complicating assessments of other states' capabilities and intentions.

Sovereign AI:
A national effort to secure control or dependable access across AI infrastructure, models and data. It is a strategic purpose that can overlap with existing spending categories and need not mean complete independence from foreign suppliers.

Stage gate:
A review point at which further investment depends on specified evidence or conditions. For AI equipment, these may include authorised access, power readiness and a credible workload.

Sunk-cost fallacy:
Allowing irrecoverable past expenditure to distort a decision about future costs and benefits. Future maintenance costs, cancellation penalties and the value of completing a useful asset remain relevant to that decision.

Technology transfer:
The movement of knowledge, skills, equipment or usable rights into a recipient institution or production system. A financial stake alone does not demonstrate that transfer has occurred.

Unrealised valuation gain or loss:
A change in the recorded value of an investment that has not been sold. It differs from realised proceeds and from the net cash return received by a fund investor.

Useful life:
The period over which an asset is expected to provide service under the relevant accounting estimate. Disclosed depreciation lives are accounting estimates; resale values and the duration of actual operation require separate evidence.

01

Introduction

Introduction

Should a government slow investment in a technology whose developers warn that it could become dangerous? The question joins decisions that operate on different timescales. A ministry can buy a service to process documents, a sovereign fund can acquire a stake in a model company, and an infrastructure consortium can reserve power for a large computing campus. Each may be described as an AI investment. Their public benefits, financial risks and implications for frontier development are quite different.

The issue has become urgent because AI now connects industrial policy with financial stability and strategic access. Infrastructure plans create obligations before final demand is known. Competition for chips and partners can shorten the time available for appraisal. Public authorities also need to understand systems they procure, manage sensitive data and preserve the option to change suppliers. Waiting carries costs, especially where scarce technical teams or politically conditional access could be lost. Moving quickly can create another dependence: a national strategy whose success is measured by maintaining the value of assets already bought.

For the Arabian Gulf, the choice is particularly consequential. Sovereign investment vehicles can participate in major financing rounds, while local institutions are developing models, research and computing infrastructure. These activities can reinforce each other, but their connection must be demonstrated. Owning part of an overseas business does not automatically give domestic engineers the ability to inspect, operate or improve its technology. Conversely, foreign collaboration can transfer precisely those skills when contracts and institutions are designed to do so.

This study argues for selective restraint within continued national effort. Governments should be prepared to defer an expensive financial claim, divide a hardware order into stages or renegotiate an inflexible compute commitment. They should be much more reluctant to lose researchers, abandon useful public research or weaken secure operational access. The relevant test is what the next commitment buys, what remains usable if market expectations disappoint, and who bears the loss if it does not.

Financial and security assessments can pull in different directions. A project that fails an ordinary return test may still secure an essential service, but that service needs a defined value and a credible delivery mechanism. Equally, a commercially attractive stake may contribute little to domestic capability. Public authorities need accounts that allow both results to be seen, and governance that permits a project to be resized without treating the decision as abandonment of the national strategy.

Background: AI Strategies, Uses and Spending

Strategies and public uses

What the spending numbers measure

Sovereign AI and the Arabian Gulf

Background: AI Strategies, Uses and Spending

Strategies and public uses

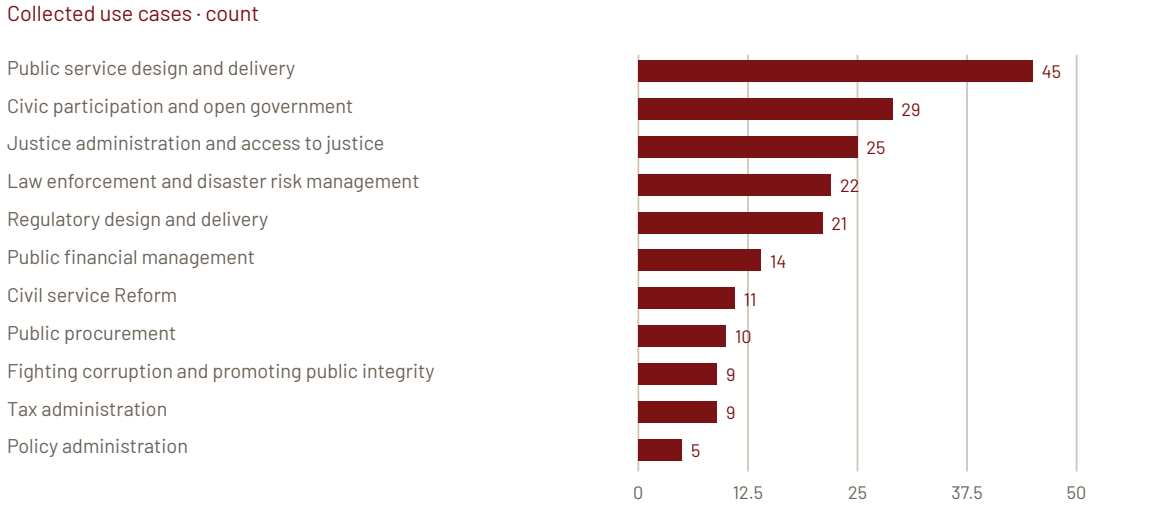
Canada announced the first national AI strategy in March 2017. The UAE followed in October 2017 as an early adopter. The chronologies compiled by Radu and HolonIQ date Qatar's strategy to 2019 and Saudi Arabia's National Strategy for Data and AI to October 2020. The UAE strategy's 2031 designation describes its policy horizon.[1]

HolonIQ's strategy mapping dates China's New Generation AI Development Plan to July 2017 and major French and German strategies to 2018. In the United States, the American AI Initiative was launched by executive order on 11 February 2019, following an earlier national AI research-and-development strategy. Roxana Radu's World Bank background paper describes overlapping reasons for subsequent revisions, including scheduled updates, technical breakthroughs and wider crises.[2,3]

OpenAI's launch of ChatGPT on 30 November 2022 popularised an existing field of conversational generative AI. Models trained to learn statistical patterns can generate outputs as well as retrieve information. Summarisation, coding assistance and administrative work offer potential productivity gains where tasks permit verification and organisations adapt their workflows. Public-service outcomes and the capacity to deliver them provide the adoption test.[4]

The OECD collected 200 government use cases across eleven functions. Public service design and delivery accounts for 45, civic participation and open government for 29, and justice administration and access to justice for 25. These selected examples map documented experimentation. They do not provide a representative estimate of spending or prevalence among officials.[5]

FIG 3.1 Collected government AI use cases by function



Source: OECD, Governing with Artificial Intelligence, 2025. Note: Reported counts of selected examples, not a representative survey. The 200 cases include five classified as Policy administration.

1 Radu, Global Landscape of National AI Strategies, 2026; HolonIQ, Global AI Strategy Landscape, 2019.
2 Ibid.
3 US President, Executive Order 13859, 2019.
4 OpenAI, Introducing ChatGPT, 2022; US Government Accountability Office, Generative AI, 2023.
5 OECD, Governing with Artificial Intelligence, 2025.

Activity classifications overlap: one service can involve internal operations, public-facing delivery and policy-making. The oversight breakdown is not shown. For policymakers, assisting a worker, informing a decision and exercising public authority require different evidence of accuracy, accountability and recourse.

FIG 3.2 Government AI activities with overlapping classifications

Counts · overlapping classifications

	Public-facing	Internal operations	Policymaking
Public service design and delivery (45)	40	7	8
Civic participation and open government (29)	8	12	14
Justice administration and access to justice (25)	16	19	0
Law enforcement and disaster risk management (22)	15	13	8
Regulatory design and delivery (21)	4	7	12
Public financial management (14)	1	7	3
Civil service Reform (11)	4	10	0
Public procurement (10)	2	6	0
Fighting corruption and promoting public integrity (9)	0	1	0
AI in Tax administration (9)	3	2	0
Policy administration (5)	0	3	3

Source: OECD, Governing with Artificial Intelligence, 2025. Note: Reported counts; classifications overlap. The oversight breakdown is not shown.

Survey evidence captures another aspect of adoption. The research consultancy Public First surveyed 3,335 public servants in ten countries with Google sponsorship. As reported by the Center for Data Innovation, which promotes policies supporting data-driven innovation, more than 70% of respondents used AI. This is not a worldwide prevalence estimate. The source groups Saudi Arabia, India and Singapore as Advanced Adopters, while Brazil and South Africa are Uneven Adopters. These categories caution against treating a broad regional or income label as an explanation of organisational readiness.[6]

In countries with clear guidance and backing for AI use, Public First's Google-sponsored survey recorded confidence of 91%, optimism of 82% and a feeling of empowerment among 79%. These figures are reported by the Center for Data Innovation, a think tank promoting policies for data-driven innovation. These conditional survey findings associate institutional support with positive attitudes; the causal contribution of guidance remains open. The policy implication is to fund the capacity to use systems well: authorised tools, secure workflows, training and a way to challenge outputs. Service outcomes provide the performance test beyond licence counts and enthusiastic responses.[7]

What the spending numbers measure

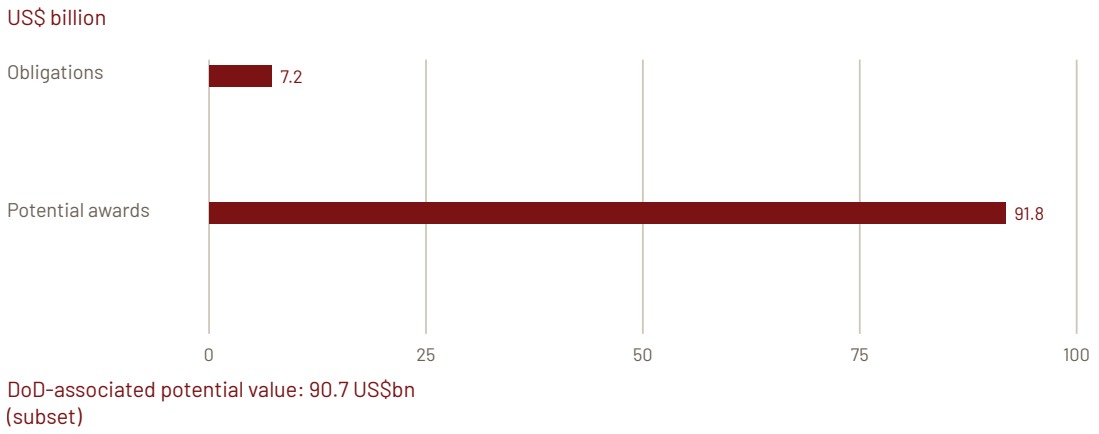
According to ETDatacenters' account, Gartner's worldwide AI-spending forecasts rise from $1.79 trillion in 2025 to $2.67 trillion in 2026. These are all-buyer figures. Gartner's reported infrastructure forecast rises from $981.92 billion to $1.48 trillion over the same years and includes more than data-centre construction. Neither series measures government expenditure. Their relevance is the size of the commercial environment in which states procure, invest and negotiate.[8]

6 Castro, Over 70% of Public Servants Worldwide Use AI, 2026.
7 Ibid.
8 ETDatacenters, AI infrastructure leads global spending, 2026.

The US Stargate announcement describes a corporate infrastructure programme. In January 2025, a new company announced an intention to invest $500 billion over four years, with $100 billion initially. SoftBank, OpenAI, Oracle and MGX were named as initial equity investors. This was a corporate investment intention, not an established federal outlay. MGX's involvement identifies an Abu Dhabi equity participant whose individual contribution remains undisclosed within the wider corporate programme.[9]

A Brookings analysis offers a narrower public-procurement measure. Its keyword-selected contract sample, covering September 2023 through March 2026, records $7.2 billion in obligations against $91.8 billion in potential awards. Department of Defense-associated potential value is $90.7 billion. Potential value can include options and unexercised capacity. Recorded obligations and potential awards describe different stages within this selected sample; a complete federal AI budget would require broader coverage. The supplier base includes universities and nonprofits, including MITRE, alongside commercial technology companies.[10]

FIG 3.3 **Federal contract obligations and potential awards**



Source: Denford, Dawson and Desouza, Where does federal AI spending stand?, 2026. Note: Reported results for a keyword-selected sample, September 2023 to March 2026. Potential awards include unexercised capacity and options; the DoD-associated value is a subset. These figures are not a complete federal AI budget.

National programmes elsewhere use still other measures. Canada's 2024 budget announced C$2.4 billion in targeted AI support, including C$2 billion over five years for compute access and sovereign computing. Semiconductor funds cover a broader technological field, while proposed initiatives identify intended resources pending execution. Ranking countries by combining such items with private pledges would primarily rank differences in coverage, timing and announcement practice. A government budget comparison needs a common payer, period, currency basis and treatment of contingent obligations.[11]

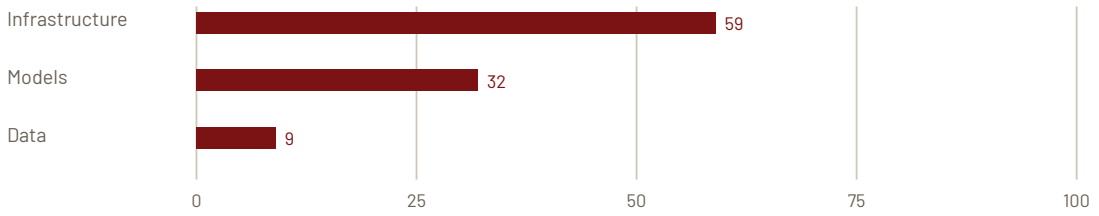
Sovereign AI and the Arabian Gulf

Sovereign AI describes a strategic purpose and degree of control across existing categories of public spending. The Center for a New American Security tracks government-backed initiatives in compute, models and data. Its index, with data current to June 2026, covers 184 projects. It reports infrastructure in 59%, models in 32% and data in 9%; projects spanning categories are counted in each. These counts describe the frequency of projects across an existing policy field; budget shares would require expenditure-weighted data.[12]

9 OpenAI, Announcing The Stargate Project, 2025.
10 Denford, Dawson and Desouza, Where does federal AI spending stand?, 2026.
11 Government of Canada, Budget 2024, Chapter 4, 2024.
12 Center for a New American Security, Sovereign AI Index, 2026.

FIG 3.4 Sovereign AI project categories

184 tracked projects · percent

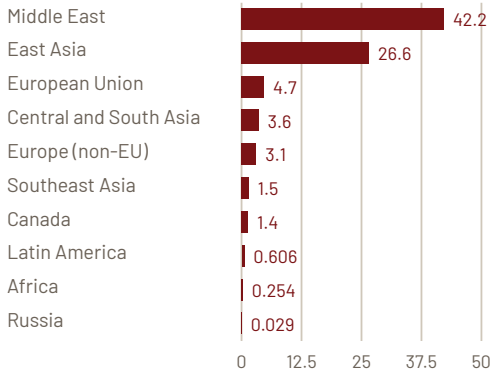


Source: Center for a New American Security, Sovereign AI Index, 2026. Note: 184 tracked projects; data current June 2026. Multi-category projects count in each category. Percentages describe project counts, not expenditure shares.

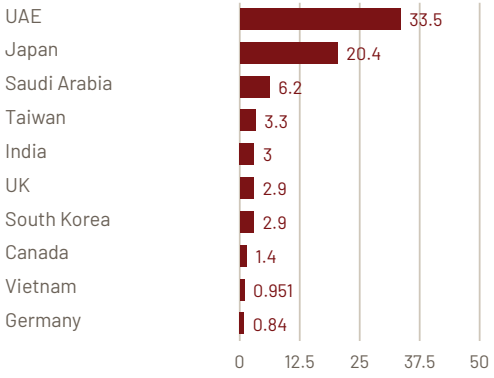
The disclosed project-budget estimates associated with that index place the Middle East prominently: approximately $42.2 billion, compared with $26.6 billion in East Asia. The country estimates include $33.5 billion for the UAE and $6.2 billion for Saudi Arabia, alongside $20.4 billion for Japan. These are reported disclosed estimates, not comparable annual public outlays. The index's methodology spans announced roadmaps and government intent through appropriations, contracts and deployed spending. Incomplete disclosure can change apparent rankings.[13]

FIG 3.5 Disclosed sovereign AI project-budget estimates

Region · disclosed estimates, US$ billion



Country · disclosed estimates, US$ billion



Source: Center for a New American Security, Sovereign AI Index, 2026. Note: Reported estimates mix announcements, government intent and deployed resources. They are not comparable annual public outlays or a complete national census. Regional and country amounts overlap.

Sovereignty also remains partial. A domestic model can depend on foreign chips, software, cloud services or research partnerships. Supplier nationality, production location and operational control need separate analysis. Shreya Joshi's Carnegie analysis treats managed interdependence as a practical alternative to complete independence. In Arabian Gulf procurement, rights, access and local operating ability determine the public benefit alongside a server's location or an investor's nationality.[14]

A worldwide public-spending total remains unavailable on these mixed bases. Individual commitments need fiscal appraisal, including their exposure to frontier-company prices and supplier terms.

13 Ibid.
14 Joshi, Early Lessons in the Pursuit of Sovereign AI, 2026; Center for a New American Security, Sovereign AI Index, 2026.

Part I: Too Big to Fail?

What the warnings say, and who is making them

Does safety regulation protect incumbents?

Sunk costs and political lock-in

Growth dependence and the geopolitical loop

Part I: Too Big to Fail?

What the warnings say, and who is making them

The warning that advanced AI could threaten humanity is neither new nor confined to corporate executives. In May 2023, the Center for AI Safety, an AI-safety research and advocacy organisation, published a statement declaring: "Mitigating the risk of extinction from AI should be a global priority alongside other societal-scale risks such as pandemics and nuclear war." Its signatories include frontier-company leaders alongside academic researchers and former employees. Signatories share concern about a category of risk, while the wording leaves probabilities, deadlines and preferred regulatory instruments open.[15]

The AI-safety advocacy organisation Future of Life Institute's March 2023 letter proposed a more specific intervention: a pause of at least six months in training systems more powerful than GPT-4. It called for government intervention if laboratories could not arrange that pause quickly. It targeted frontier training while leaving broader public-service adoption, university research and infrastructure policy open.[16]

In a BBC interview following his departure from Google in May 2023, Geoffrey Hinton warned that systems might soon become more intelligent than humans. As a departing employee, he occupied a different position from a chief executive selling frontier services.[17]

Yoshua Bengio led the International AI Safety Reports. The report published in January 2025 examined misuse, malfunction and systemic risks while recording substantial disagreement about future loss of control. It said current systems lacked the capabilities for the specified loss-of-control risk at that report's date. The second report, published in February 2026, involved more than 100 experts and backing from more than 30 countries and international organisations.[18]

Sam Altman and Dario Amodei combine prominent warnings with direct institutional interests. OpenAI's May 2023 governance essay, co-authored by Altman, Greg Brockman and Ilya Sutskever, proposed an international authority with inspection and audit powers above a capability or compute threshold. Anthropic's safety statements discuss uncertainty about reliably controlling advanced systems. Amodei also argues for large potential benefits: his October 2024 essay describes both underappreciated upside and underappreciated risks. His January 2026 essay explicitly avoids communicating certainty about the outcomes it discusses.[19,20]

Sincere concern about uncontrolled frontier progress can coexist with support for investment in the infrastructure, research or national leadership a developer considers safer. Commercial conflicts can arise within that position. The requested rules and who bears their costs offer evidence for assessing them.

Jacob Coxon brought an insider warning to a wider audience in 2026. Reuters described him in October 2026 as a former Anthropic and OpenAI researcher. Its account places his X post in September and reports 175 million views. Reuters paraphrased his position as an uncomfortably high and rising risk that AI could wipe out humanity within a few years.[21]

15 Center for AI Safety, Statement on AI Extinction Risk, 2023.
16 Future of Life Institute, Pause Giant AI Experiments, 2023.
17 Kleinman and Vallance, AI 'godfather' Geoffrey Hinton warns of dangers, 2023.
18 International AI Safety Report, International AI Safety Report 2025, 2025; International AI Safety Report, International AI Safety Report 2026, 2026.
19 Altman, Brockman and Sutskever, Governance of superintelligence, 2023.
20 Anthropic, Core views on AI safety, 2023; Amodei, Machines of Loving Grace, 2024; Amodei, The Adolescence of Technology, 2026.
21 Stewart, Interview with Jacob Coxon, publication date unverified; public interview linked by Jamie McGeever in Reuters Morning Bid Weekend, 16 October 2026. Employment history, post timing, views and the risk paraphrase are attributed to Reuters reporting, not independently verified from the interview or X.

Bloomberg reported Coxon's testimony at a New York City Council hearing in early October, where lawmakers considered safeguards. Reuters subsequently recommended his interview with Jon Stewart. Beth Kowitt's Bloomberg Businessweek account quoted the fragment "gambling with our lives" and framed the resignation post as a "Rorschach test": readers could interpret it through whistleblowing, pessimism, marketing or concern that extinction arguments distract from present harms.[22,23]

An insider can make uncertain technical risks vivid to people who would not read a safety assessment. Forecasts and technical claims still require evidence beyond reach and employment credentials. Governments should request independent evaluation and protect reporting channels, while assessing the technical claims separately from the authority of a single departure.

Does safety regulation protect incumbents?

A sharper hypothesis concerns regulatory capture: leading US frontier laboratories warn loudly because the safeguards they seek would raise competitors' costs and eventually choke open-source or open-weight alternatives. Open weights are downloadable model parameters; open source additionally concerns licensing and access to development materials. These distinctions affect who can inspect, adapt and redistribute a model. Commercial publishers of open weights have their own interests, just as closed-model developers do.[24]

The hypothesis has separable steps. Prominent firms issue warnings. Some seek rules with fixed compliance costs or discretionary approval. Such rules may favour incumbents able to absorb those costs. The stronger claim adds an intention to suppress rivals, insincerity about danger and a demonstrated exclusionary outcome. Each step requires its own evidence, particularly the transition from lobbying to intention and market exclusion.

There is a credible entry-barrier mechanism. Inspection, audits and restrictions on deployment require specialist staff, documentation and interaction with regulators. OpenAI's superintelligence proposal creates a potential control point above its stated thresholds. A regulator that builds requirements around established laboratories' internal procedures could make those procedures a costly standard for others. Whether this is justified depends on the risk addressed, the scope of duties and the availability of less restrictive alternatives.[25]

Documented lobbying also supports scrutiny. TIME reported, on the basis of a white paper and meeting records, that OpenAI sought to avoid automatic high-risk treatment of GPT-3 and DALL-E 2 under the developing European framework, preferring obligations tied to downstream high-risk uses. OpenAI told TIME that it continued to support the EU's objective of safe development, deployment and use.[26]

National-security advocacy can have competitive effects too. Amodei argued for stronger chip export controls after DeepSeek's emergence. OpenAI's submission for the US AI Action Plan described DeepSeek in politically charged terms and sought policies favouring US leadership. Those positions align stated security concerns with commercial advantage. A government assessing them should separate the factual case about diversion or military use from the benefit a restriction confers on a rival supplier.[27]

22 Ibid.
23 Bloomberg, Ex-Anthropic Researcher Testifies, 2026; Kowitt, AI researchers face growing questions about ethics and accountability, 2026.
24 OpenAI, Introducing gpt-oss, 2025; Qwen Team, Qwen3, 2025.
25 Altman, Brockman and Sutskever, Governance of superintelligence, 2023.
26 Perrigo, OpenAI Lobbied the E.U. to Water Down AI Regulation, 2023.
27 Amodei, On DeepSeek and Export Controls, 2025; OpenAI, Proposals for the U.S. AI Action Plan, 2025; OpenAI, OSTP/NSF AI Action Plan submission, 2025.

Anthropic's endorsement of California's SB53 supplies evidence on both sides. The company expressly said the legislation formalised practices that frontier laboratories already followed, illustrating how incumbent routines can become regulatory benchmarks. It also supported a focus on the largest developers and exemptions for smaller firms. The enacted law imposes safety-framework, transparency and incident-related duties on covered developers. Measuring the actual compliance costs would clarify the law's effects on entry.[28]

Counter-evidence limits the broader accusation. The differing roles of Hinton, Bengio and the international assessments weaken an explanation based on a single closed-laboratory lobbying bloc. OpenAI has sought relief from state regulation through federal arrangements, which contradicts a uniform preference for tighter rules. In August 2025 it released its own gpt-oss open-weight models. Qwen and Mistral also continued releasing open-weight models under permissive licences. These releases provide observable counter-evidence to an achieved sector-wide choke.[29,30]

Critics should receive the same scrutiny. Marc Andreessen of the venture-capital firm Andreessen Horowitz makes a case for freely proliferating open-source AI that includes an explicit warning about incumbent protection, while holding commercial interests. An advocate's interests and the merits of the argument require separate assessment. The relevant evidence is a particular rule, its burden, who helped design it, and whether it prevents a release or makes entry uneconomic relative to a credible alternative.[31]

Lobbying is documented with high confidence: company policy proposals state the rules sought, and TIME's account rests on documents and meetings. That supports scrutiny of commercial interests, without proving capture of the resulting rules.[32,33,34]

An entry-cost advantage is plausible with moderate confidence. Audits, specialist staffing and incumbent procedures becoming regulatory benchmarks supply a mechanism; small-firm exemptions limit its scope. The cited evidence does not measure actual compliance costs or their effect on entry.[35]

Intent to suppress rivals, or to issue warnings insincerely, is not established. Security advocacy can confer commercial advantage, but the cited proposals do not establish that motive. The evidence is insufficient to assign confidence to the stronger intent claim; the differing positions of former employees and international researchers also resist a single corporate explanation.[36,37]

Achieved sector-wide exclusion is not established. Continued gpt-oss, Qwen and Mistral releases provide high-confidence evidence against a complete open-weight choke. Their existence does not measure marginal compliance harm, for which the cited record is insufficient. Governments should assess safety rules for proportionality and competition effects without treating either supplier assurances or allegations of bad faith as decisive.[38,39]

28 Anthropic, A framework for AI development transparency, 2025; Anthropic, Endorsing SB 53, 2025; California Legislature, SB 53, 2025.
29 OpenAI, Introducing gpt-oss, 2025; Qwen Team, Qwen3, 2025.
30 OpenAI, Proposals for the U.S. AI Action Plan, 2025; OpenAI, Introducing gpt-oss, 2025; Qwen Team, Qwen3, 2025; Mistral AI, Introducing Mistral 3, 2025.
31 Andreessen, Why AI Will Save the World, 2023.
32 Altman, Brockman and Sutskever, Governance of superintelligence, 2023.
33 Perrigo, OpenAI Lobbied the E.U. to Water Down AI Regulation, 2023.
34 Amodei, On DeepSeek and Export Controls, 2025; OpenAI, Proposals for the U.S. AI Action Plan, 2025; OpenAI, OSTP/NSF AI Action Plan submission, 2025.
35 Anthropic, A framework for AI development transparency, 2025; Anthropic, Endorsing SB 53, 2025; California Legislature, SB 53, 2025.
36 International AI Safety Report, International AI Safety Report 2025, 2025; International AI Safety Report, International AI Safety Report 2026, 2026.
37 Amodei, On DeepSeek and Export Controls, 2025; OpenAI, Proposals for the U.S. AI Action Plan, 2025; OpenAI, OSTP/NSF AI Action Plan submission, 2025.
38 OpenAI, Introducing gpt-oss, 2025; Qwen Team, Qwen3, 2025.
39 OpenAI, Proposals for the U.S. AI Action Plan, 2025; OpenAI, Introducing gpt-oss, 2025; Qwen Team, Qwen3, 2025; Mistral AI, Introducing Mistral 3, 2025.

TABLE 4.1: REGULATORY-CAPTURE EVIDENCE FOR AND AGAINST

Evidence	Confidence	Inferential limit
For capture risk / self-interest		
Threshold-based inspection and audit proposal	Confirmed	Competitive effect inferred; not measured exclusion
Document-based account of EU lobbying	Reported	Not proof of an open-weight ban
Advocacy of tighter chip access	Confirmed	Security and commercial motives not isolated
SB53 formalises practices frontier labs already follow	Confirmed	Cost advantage not measured
Federal partnerships and state-law relief proposal	Confirmed	Selective regulation rather than uniform tightening
Counter-evidence		
International scientific reports and former-employee warnings	Confirmed	Affiliations vary; not evidence every individual is financially independent
Federal pre-emption advocacy	Confirmed	Proposal not verified enactment
OpenAI gpt-oss release	Confirmed	Does not settle policy toward unrestricted frontier releases
Small-firm exemptions and duties on incumbents	Confirmed	Actual incidence unmeasured
Continued Qwen and Mistral releases	Confirmed	Does not exclude marginal compliance harm

Source: Altman, Brockman and Sutskever, Governance of superintelligence, 2023; Perrigo, OpenAI Lobbied the E.U. to Water Down AI Regulation, 2023; Amodei, On DeepSeek and Export Controls, 2025; Anthropic, Endorsing SB 53, 2025; OpenAI, Proposals for the U.S. AI Action Plan, 2025; International AI Safety Report, International AI Safety Report 2025, 2025; OpenAI, Introducing gpt-oss, 2025; Qwen Team, Qwen3, 2025; Mistral AI, Introducing Mistral 3, 2025. Note: The EU lobbying account is reported evidence. Statements and releases establish what was said or published; motives and competitive effects require separate evidence. Lobbying is documented with high confidence from company proposals and document-based reporting. An entry-cost advantage is plausible with moderate confidence, because compliance costs and entry effects are unmeasured and exemptions limit coverage. Intent to suppress rivals or issue insincere warnings is unestablished. Achieved sector-wide exclusion is unestablished: continued releases give high-confidence evidence against a complete choke, but do not measure marginal compliance harm.

Sunk costs and political lock-in

Public exposure can become difficult to unwind even without regulatory capture. The sunk-cost fallacy occurs when irrecoverable past expenditure distorts a decision about future costs and benefits. Hal Arkes and Catherine Blumer's work established a research programme on the psychology of sunk cost; Arkes and Peter Ayton later examined the sunk-cost and Concorde effects. Concorde's Anglo-French development and major cost escalation provide a familiar historical reference. Assessing the motives for continuation requires evidence about the reasoning behind particular funding decisions.[40]

For AI, the mechanism is contingent. A government announces an industrial transformation, commits land and power, and links institutional reputations to a facility. If demand disappoints, decision-makers may treat further funding as necessary to vindicate the earlier announcement. The risk is particularly acute when the same institution sponsors the project, certifies its strategic value and decides whether to rescue it.

A prospective assessment can still justify continuation. Existing power connections, useful staff and partially completed buildings may make finishing a project preferable to abandonment. Cancellation penalties are future costs, even when earlier expenditure cannot be recovered. Maintenance spending may preserve an asset that retains value. The test is whether the next commitment earns its cost or secures an explicitly valued public capability, compared with stopping, resizing, selling or changing the project.

40 Arkes and Blumer, The psychology of sunk cost, 1985; Arkes and Ayton, The sunk cost and Concorde effects, 1999; Wikipedia contributors, Concorde, n.d.

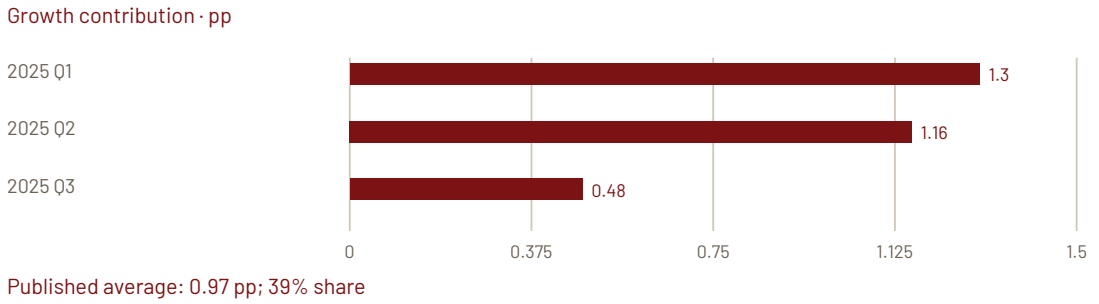
That test becomes easier if it is specified before commitment. Stage gates can identify the demand, licence and power conditions needed for further orders. Independent reviewers can compare expansion with alternatives that do not preserve the original design. Public reporting should distinguish write-downs from new authorisations so that admitting a loss does not require concealing it inside a larger programme.

Growth dependence and the geopolitical loop

In its October 2026 Global Financial Stability Report and accompanying analysis by Athanasios Vamvakidis and Jason Wu, the IMF describes a scenario in which weaker or less durable AI investment and profitability trigger asset-price corrections, amplified by leverage and concentration. This is a financial-stability risk under a specified downside scenario; it does not establish that the technology will receive a bailout.[41]

Hannah Rubinton and Bontu Ankit Patro at the St. Louis Fed estimated that software, research and development, information-processing equipment and data-centre construction together contributed an average 0.97 percentage points, or 39% of real GDP growth, over the first three quarters of 2025. These broad categories include non-AI activity. Their displayed, rounded quarterly contributions were 1.30, 1.16 and 0.48 percentage points. The figures attribute growth to expenditure categories; identifying AI's causal productivity effect would require a different analysis.[42]

FIG 4.1 **Broad investment categories and US growth contributions**



Source: Rubinton and Patro, Tracking AI's Contribution to GDP Growth, 2026. Note: Estimates cover software, R&D, information-processing equipment and data-centre construction, including non-AI activity. Contributions are annualised percentage points; the source reports an average of 0.97 percentage points, or 39% of growth, for Q1 to Q3 2025. The displayed quarterly values are rounded and do not reproduce that source-reported average exactly. Imported-equipment offsets appear elsewhere in GDP accounts.

Imported equipment has an offset elsewhere in the national accounts. An investment contribution can also fall because spending grows more slowly from a high level, even if investment remains elevated. Maintaining an announced spending path must therefore be judged against the future productive services and risks of the investment, not just its contribution to current demand.

Political incentives can nevertheless reinforce expansion. Local employment, construction activity, fiscal expectations and the prestige of technological leadership may become linked to continued spending. Strategic rivalry adds another justification: reducing a programme can be presented as conceding ground to a competitor. The combination can narrow debate until a choice between alternative investments appears to be a choice between national advance and retreat.

During a market correction, security-critical access and skilled teams may warrant continued support. A weak financial stake or underused expansion does not acquire the same claim merely because it carries an AI label.

41 International Monetary Fund, Global Financial Stability Report, 2026; Vamvakidis and Wu, Global Financial Markets Face Rising Risks, 2026.
42 Rubinton and Patro, Tracking AI's Contribution to GDP Growth, 2026.

Part II: The Coxon-Bubble Paradox — Bubbles That Built the World

British Railway Mania, 1844–1850

Radio and electricity in the 1920s

Dot-com and telecom, 1995–2002

Comparing the cases and the frameworks

Asset life changes the AI comparison

Is AI in a bubble now?

Part II: The Coxon-Bubble Paradox — Bubbles That Built the World

The Coxon-Bubble Paradox is this study's own label for a contemporary tension: insiders warn of danger while capital floods into the industry. A safety warning concerns possible harms from a technology. A financing decision concerns ownership claims on expected revenue. Investors may discount the warning, expect regulation to contain it, or believe they will benefit before its consequences emerge. Aggregate spending is consistent with several such motives operating across the industry.

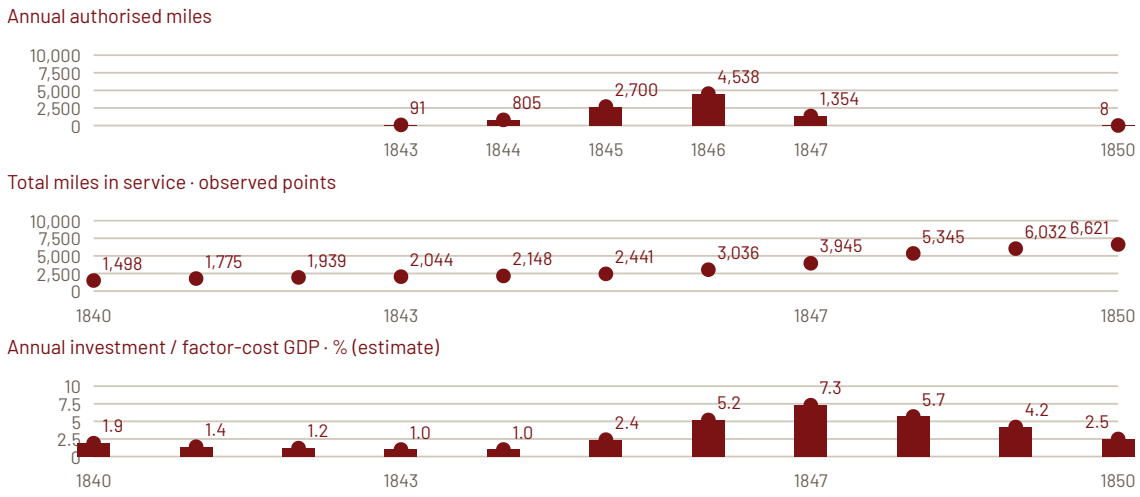
Railway networks, radio, electricity and the internet continued spreading after severe market reversals. Useful assets and capabilities outlasted some of the financial structures that funded them, with subsequent gains reaching different people. This survival neither made the crashes harmless nor established that they were necessary. Whether AI will leave a similar legacy depends on the kind of investment and on the ability to reuse what it creates.

British Railway Mania, 1844–1850

The railway boom provides unusually clear evidence of construction continuing after financial enthusiasm weakened. In Andrew Odlyzko's historical series, Parliament authorised 805 miles of new railway in 1844, 2,700 in 1845 and 4,538 in 1846. These are annual authorisations for proposed mileage, measured separately from completed lines. The operating network grew from 2,148 miles in 1844 to 6,621 in 1850. Treating authorisations and in-service mileage as equivalent would obscure the lag between speculative promotion, financing and physical completion.[43]

Annual railway fixed investment reached £43.9 million in 1847. Against reconstructed factor-cost GDP of £604 million, that is an estimated 7.3% (£43.9 million / £604 million × 100). Spending continued as the market declined, partly because investors still had to finance construction already under way. The reconstruction describes a major mobilisation of domestic resources. Its historical GDP basis and construction coverage prevent using the percentage as a directly comparable ceiling for today's global corporate AI budgets.[44]

FIG 5.1 **Railway permissions, operating mileage and investment intensity**

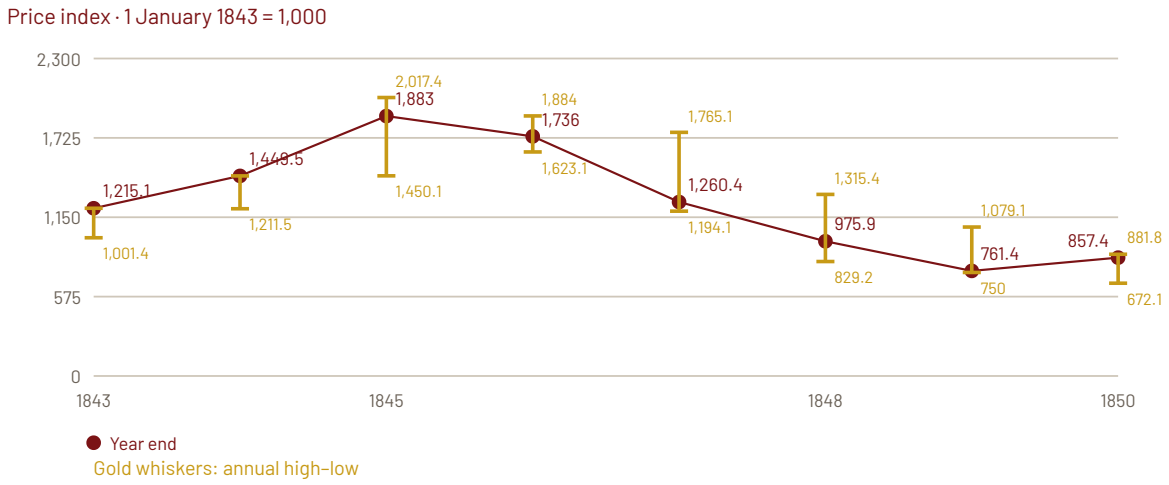


Source: Odlyzko, Collective hallucinations and inefficient markets, 2010. Note: Investment intensity is estimated as annual railway fixed investment / reconstructed factor-cost GDP × 100. Authorisations are annual permissions; operating mileage is cumulative. Blank authorisation years indicate missing observations. Percentage labels are rounded to one decimal place to reflect the reconstructed inputs.

43 Odlyzko, Collective hallucinations and inefficient markets, 2010.
44 Ibid.

Gareth Campbell and John Turner's broad railway share index fell from 2,017.4 on 9 August 1845 to 672.1 on 16 April 1850, approximately 67% ((1 – 672.1 / 2,017.4) × 100). Their reconstruction accounts for capital calls on partly paid shares and has broader coverage than an index restricted to a few established companies. The railway peak preceded the financial crisis of 1847, which aggravated an existing decline.[45]

FIG 5.2 **Railway shares through the reversal**



Source: Campbell and Turner, The Greatest Bubble in History, 2010. Note: Reconstructed price index, 1 January 1843 = 1,000, accounting for capital calls. The approximate 67% decline is estimated as (1 – 672.1 / 2,017.4) × 100. It is not a total return. No observations cover 1840 to 1842.

The index retained about a third of its peak value at the trough (672.1 / 2,017.4). Investors experienced different outcomes according to entry price, dividends, subsequent calls and the company held. Odlyzko's separate study of the railway speculation of the 1830s is an additional counterexample: in that episode, investment continued, prices recovered and investors achieved above-market returns. Even adjacent booms in the same technology need not share one financial outcome.[46]

The physical and organisational gains were more durable than peak valuations. Railway construction developed surveying, civil engineering, signalling and coordinated operations. Telegraph demand accompanied railway expansion. Routes and rights of way could support later generations of equipment even when original rails or locomotives needed replacement. Rising goods and total revenues after the mania indicate growing use, though revenue is not a direct measure of freight-cost savings or social welfare.[47]

The public-policy implication concerns who pays for those gains. Later users can benefit from a network whose original investors receive disappointing returns. A state may value connectivity or skills beyond the operator's receipts, but the public-benefit case must assess route duplication and compare speculative finance with alternative ways of obtaining the network, accounting for the costs borne by its initial investors.

Radio and electricity in the 1920s

Radio and electrification reveal the same separation through household adoption and corporate finance. According to Bryan Taylor's Finaeon account, RCA common stock fell from $114.75 in September 1929 to $2.625 in May 1932 on the provider's price basis, about 98% ((1 – $2.625 / $114.75) × 100). The same article also gives a $2.50 low, which likewise implies an approximate 98% decline ((1 – $2.50 / $114.75) × 100). Both

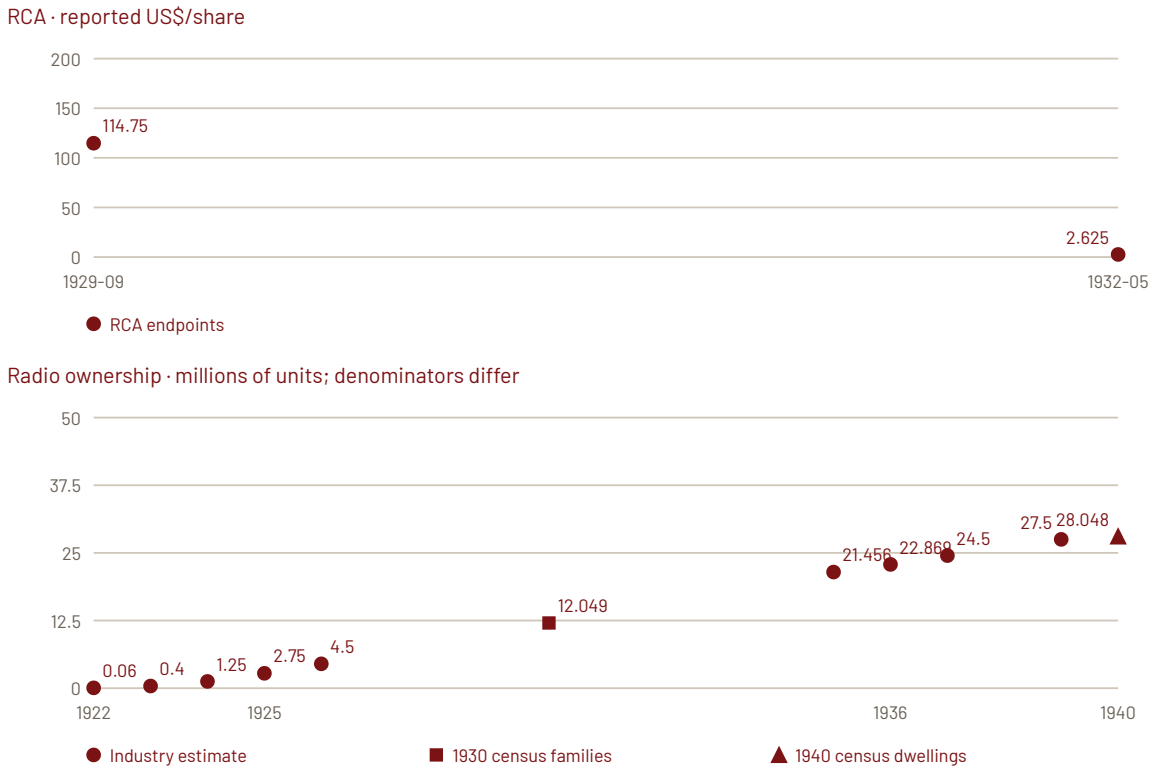
45 Campbell and Turner, The Greatest Bubble in History, 2010.
46 Odlyzko, This time is different, 2010.
47 Odlyzko, Collective hallucinations and inefficient markets, 2010.

endpoints require the same split basis to measure the reported loss consistently.[48]

Taylor also describes RCA's survival and subsequent importance in television development. For someone buying at the peak, long-run total return depends on splits, distributions, reinvestment and the eventual exit price. RCA's engineering organisation and the underlying technology continued through the financial collapse, providing the corporate basis for its later development.

Radio use continued to spread. The US census recorded roughly 12 million families with radios in 1930 and about 28 million occupied dwelling units with radios in 1940. The census observations use different denominators: families and occupied dwelling units. The annual industry estimates include 21,456,000 radio-owning households in 1935, distinct from the census counts. The two RCA price endpoints and the household-adoption observations document a sharp price reversal alongside continued diffusion, on their separately measured bases.[49]

FIG 5.3 **RCA price endpoints and the spread of household radio**



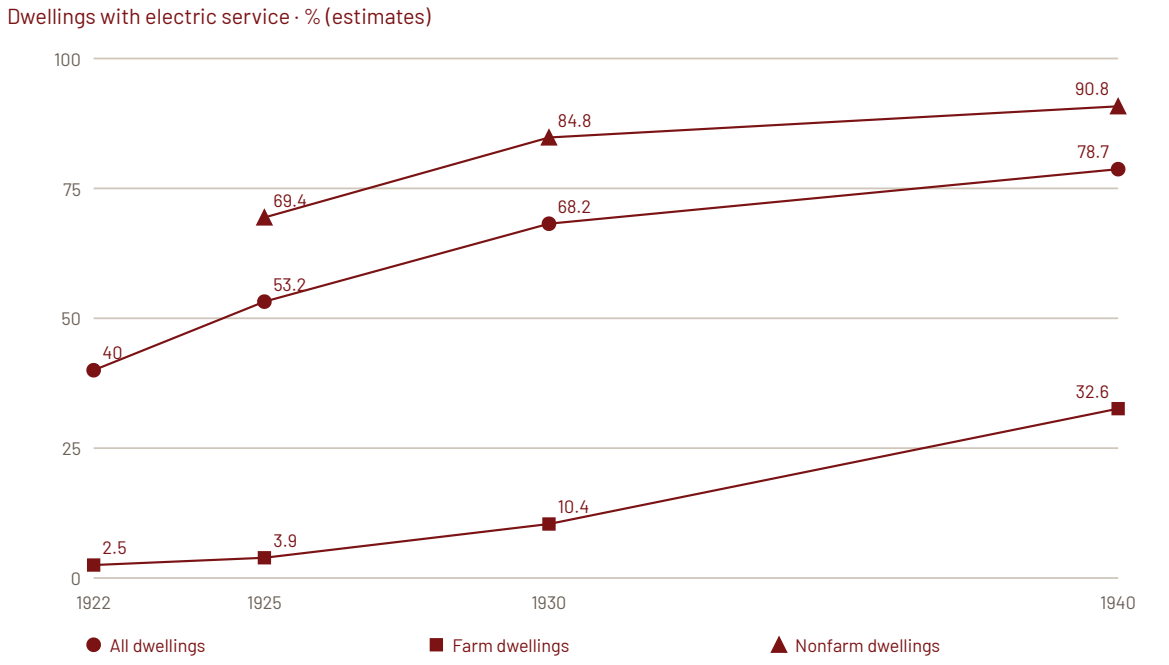
Source: Taylor, RCA and the Roaring Twenties, 2023; US Bureau of the Census, Historical Statistics of the United States, chapter R, 1975. Note: RCA endpoints are reported on the provider's split basis; the source also gives a $2.50 low alongside $2.625. The estimated decline is about 98% ((1 − 2.625 / 114.75) × 100). Radio ownership uses industry estimates except for the 1930 census count of families and the 1940 count of occupied dwellings. The 1935 industry estimate is 21,456,000 households. Missing price years have no observations.

Historical accounts of Samuel Insull describe the collapse of his leveraged holding-company structures in 1932 while underlying generation and distribution continued. They also record his acquittal on criminal charges. Operating utilities and parent-company securities are distinct assets, with different claims and financial outcomes for their holders. The capacity to keep electricity flowing could survive the failure of the structure promising financial returns.[50]

48 Taylor, RCA and the Roaring Twenties, 2023. The source also mentions a $2.50 low alongside the $2.625 endpoint used here.
49 US Bureau of the Census, Historical Statistics of the United States, chapter R, 1975.
50 Wikipedia contributors, Samuel Insull, n.d.

Historical estimates in the US Census compilation put electric service at 40.0% of all dwellings and 2.5% of farm dwellings in 1922. Access reached 53.2% of all dwellings in 1925, 68.2% in 1930 and 78.7% in 1940. Farm access remained much lower, rising from 3.9% to 10.4% and then 32.6%. Access spread unevenly across farm and nonfarm dwellings as institutions and financing arrangements shaped who could use the technology.[51]

FIG 5.4 **Electrification continued through financial distress**



Source: US Bureau of the Census, Historical Statistics of the United States, chapter S, 1975. Note: Historical estimates of electric service use separate all-dwelling, farm and nonfarm denominators. The 1922 estimates are 40.0% for all dwellings and 2.5% for farm dwellings; only the nonfarm observation is missing.

The Rural Electrification Administration, established in May 1935, supported rural generation, transmission and distribution. Cooperatives and public lending helped extend access after the crash. Spectrum institutions likewise contributed to radio's development: the Federal Radio Commission was established in 1927, with powers transferred to the FCC in 1934. These institutions addressed coordination and service access alongside technical development.[52,53]

Reusing distressed assets requires operators, standards, connections and users able to employ them. Public policy can help create those complements. It can also allocate losses badly if it protects speculative securities while neglecting service access.

Dot-com and telecom, 1995–2002

The internet boom joins dramatic price losses with continued adoption and reusable infrastructure. The Nasdaq Composite's daily close fell from 5,048.62 on 10 March 2000 to 1,114.11 on 9 October 2002, approximately 78% ((1 – 1,114.11 / 5,048.62) × 100). This is a broad composite, not a pure telecom index, and those daily observations differ from monthly endpoints or an intraday high. A market drawdown also does not measure money physically destroyed or provide a clean estimate of losses across all technology investors.[54]

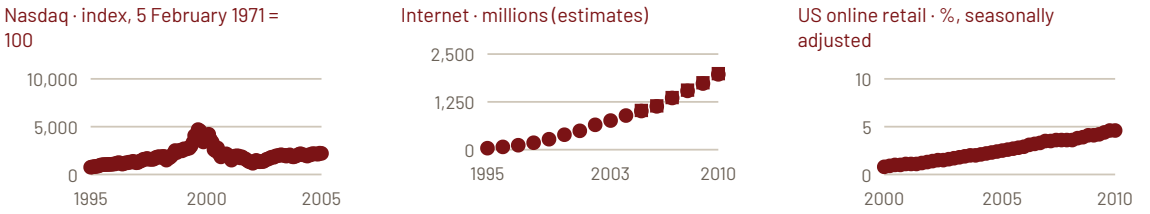
51 US Bureau of the Census, Historical Statistics of the United States, chapter S, 1975.
52 US Bureau of the Census, Historical Statistics of the United States, chapter R, 1975.
53 US Bureau of the Census, Historical Statistics of the United States, chapter S, 1975.
54 Nasdaq, NASDAQ Composite Index, n.d.

According to the industry association USTelecom's historical compilation, US broadband-provider capital expenditure reached $118.1 billion in 2000, covering wireline, wireless and cable. Relative to nominal US GDP, the estimated ratio is 1.15% ($118.1 billion / $10,250.952 billion × 100). This is a narrower sectoral numerator than all information technology and a different measure from the railway construction series. Their comparison illustrates scale and measurement differences, leaving the conditions that make a particular investment boom unsafe to a separate assessment.[55]

Adoption continued after the market reversal. Available country estimates suggest internet users numbered roughly 40 million in 1995 (sum of reporting-country estimates = 38,963,590, rounded) and roughly 400 million in 2000 (sum = 391,153,369, rounded), but the set of reporting economies expands between those observations. The changing coverage limits comparisons between these country sums. Published world estimates available from 2005 show around a billion users (1,025,764,000 rounded), rising to around two billion in 2010 (1,988,244,400 rounded). The published world estimates form a distinct series with their own coverage and measurement basis.[56]

US retail e-commerce provides a more consistent adoption measure. Its seasonally adjusted share of retail sales rose from 0.8% in the first quarter of 2000 to 2.6% in the fourth quarter of 2005 and 4.6% in the fourth quarter of 2010. This measures US retail, excluding much broader business-to-business activity. Its post-crash expansion tracks continued commercial adoption; shareholder returns require separate evidence about the securities held and their purchase prices.[57]

FIG 5.5 **Nasdaq prices, internet adoption and US online retail**



● Nasdaq monthly endpoints · values in plotted order

1: 755.2	2: 793.73	3: 817.21	4: 843.98	5: 864.58	6: 933.45	7: 1,001.21	8: 1,020.11	9: 1,043.54	10: 1,036.06	11: 1,059.2	12: 1,052.13
13: 1,059.79	14: 1,100.05	15: 1,101.4	16: 1,190.52	17: 1,243.43	18: 1,185.02	19: 1,080.59	20: 1,141.5	21: 1,226.92	22: 1,221.51	23: 1,292.61	24: 1,291.03
25: 1,379.85	26: 1,309	27: 1,221.7	28: 1,260.76	29: 1,400.32	30: 1,442.07	31: 1,593.81	32: 1,587.32	33: 1,685.69	34: 1,593.61	35: 1,600.55	36: 1,570.35
37: 1,619.36	38: 1,770.51	39: 1,835.68	40: 1,868.41	41: 1,778.87	42: 1,894.74	43: 1,872.39	44: 1,499.25	45: 1,693.84	46: 1,771.39	47: 1,949.54	48: 2,192.69
49: 2,505.89	50: 2,288.03	51: 2,461.4	52: 2,542.85	53: 2,470.52	54: 2,686.12	55: 2,638.49	56: 2,739.35	57: 2,746.16	58: 2,966.43	59: 3,336.16	60: 4,069.31
61: 3,940.35	62: 4,696.69	63: 4,572.83	64: 3,860.66	65: 3,400.91	66: 3,966.11	67: 3,766.99	68: 4,206.35	69: 3,672.82	70: 3,369.63	71: 2,597.93	72: 2,470.52
73: 2,772.73	74: 2,151.83	75: 1,840.26	76: 2,116.24	77: 2,110.49	78: 2,160.54	79: 2,027.13	80: 1,805.43	81: 1,498.8	82: 1,690.2	83: 1,930.58	84: 1,950.4
85: 1,934.03	86: 1,731.49	87: 1,845.35	88: 1,688.23	89: 1,615.73	90: 1,463.21	91: 1,328.26	92: 1,314.85	93: 1,172.06	94: 1,329.75	95: 1,478.78	96: 1,335.51
97: 1,331.04	98: 1,342.73	99: 1,357	100: 1,472.69	101: 1,599.92	102: 1,621.44	103: 1,757.37	104: 1,813.82	105: 1,802.71	106: 1,937.14	107: 1,963.06	108: 1,996.62
109: 2,065.44	110: 2,018.83	111: 2,004	112: 1,919.39	113: 1,990.81	114: 2,055.65	115: 1,896.31	116: 1,838.1	117: 1,896.84	118: 1,974.99	119: 2,096.81	120: 2,175.44
121: 2,062.41	122: 2,051.72	123: 1,999.23	124: 1,921.65	125: 2,068.22	126: 2,056.96	127: 2,184.83	128: 2,152.9	129: 2,151.69	130: 2,120.3	131: 2,232.82	132: 2,205.32

● Internet country sums · values in plotted order

1: 38.964	2: 72.482	3: 116.312	4: 181.389	5: 273.498	6: 391.153	7: 493.085	8: 650.062
9: 761.205	10: 892.569	11: 1,010.398	12: 1,132.634	13: 1,351.587	14: 1,537.054	15: 1,728.955	16: 1,969.71

■ Internet published world · values in plotted order

1: 1,025.764	2: 1,145.44	3: 1,362.298	4: 1,557.258	5: 1,749.791	6: 1,988.244

● US quarterly retail share · values in plotted order

1: 0.8	2: 0.9	3: 1	4: 1	5: 1.1	6: 1.1	7: 1.1	8: 1.2	9: 1.3	10: 1.4	11: 1.5	12: 1.5
13: 1.6	14: 1.7	15: 1.8	16: 1.9	17: 2	18: 2	19: 2.1	20: 2.2	21: 2.3	22: 2.4	23: 2.5	24: 2.6
25: 2.7	26: 2.8	27: 2.9	28: 3.1	29: 3.2	30: 3.3	31: 3.5	32: 3.5	33: 3.6	34: 3.6	35: 3.6	36: 3.6
37: 3.8	38: 3.9	39: 4.1	40: 4.1	41: 4.2	42: 4.4	43: 4.6	44: 4.6				

Reporting economies by year: 1995: 138; 1996: 171; 1997: 181; 1998: 187; 1999: 194; 2000: 196; 2001: 199; 2002: 202; 2003: 195; 2004: 198; 2005: 199; 2006: 200; 2007: 203; 2008: 202; 2009: 202; 2010: 201

Source: Nasdaq, NASDAQ Composite Index, n.d.; International Telecommunication Union / World Bank, Number of people using the Internet, 2026; US Census Bureau, E-Commerce Retail Sales as a Percent of Total Sales, n.d. Note: Internet counts are estimates. Reporting-country coverage changes over time; country sums and published world estimates are separate series. World estimates begin in 2005. Nasdaq observations are monthly endpoints; US online-retail shares are seasonally adjusted quarterly observations beginning in 2000.

55 USTelecom, Research Brief, 2019; US Bureau of Economic Analysis, Gross Domestic Product, n.d.
56 International Telecommunication Union / World Bank, Number of people using the Internet, 2026.
57 US Census Bureau, E-Commerce Retail Sales as a Percent of Total Sales, n.d.; US Census Bureau, E-Commerce Retail Sales, n.d.

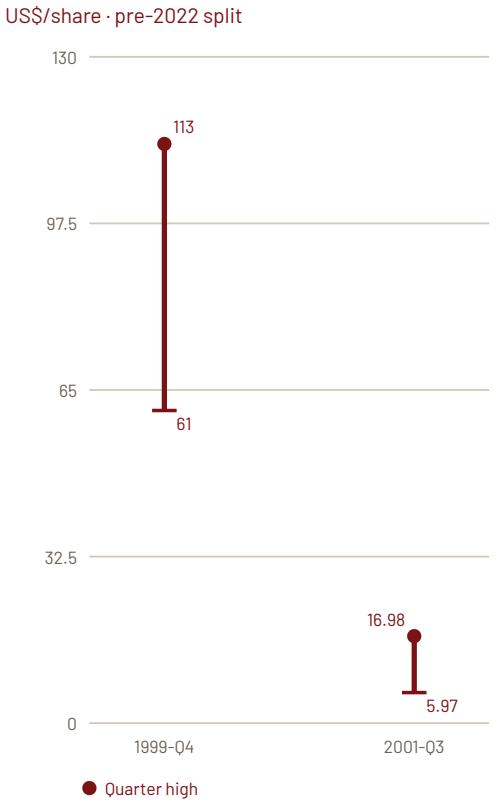
Fibre contributed a physical legacy, but it also illustrates the dangers of interpreting unused capacity. A contemporary New York Times News Service account estimated that only 5% of installed fibre was active. Its coverage and estimated status limit inferences about the stock of usable infrastructure. Fibre-miles count individual strands rather than route distance. Dark strands could be redundant, reserved for future needs or economically useful after changes in equipment and ownership; inactivity alone cannot distinguish those cases.[58]

Elise Couper, John Hejkal and Alexander Wolman's Richmond Fed study describes rapid improvements in transmission through multiplexing. More bandwidth could be supplied over existing glass, undermining forecasts based on the need to lay ever more fibre. The authors also stress regulation, litigation and uncertain fundamentals, explicitly rejecting the claim that their evidence proves an irrational asset bubble.[59]

Bankruptcy could preserve a network while extinguishing the original financial claim. Reported accounts of WorldCom's reorganisation describe cancellation of its old common shares while the business emerged as MCI and was later acquired by Verizon. Other networks changed owners after distress. A subsequent buyer facing a lower acquisition cost could operate profitably without validating the original valuation or recovering the money invested by the earlier shareholders.[60]

Amazon supplies a different outcome. Its filings record a $113 high during the fourth quarter of 1999 and a $5.97 low during the third quarter of 2001 on a consistent pre-2022-split basis, a decline of about 95% ((1 − $5.97 / $113) × 100). These are selected quarterly range observations, not named-day closing prices. Amazon survived. Its shareholder letter describes work on fulfilment productivity, cost reduction and marketplace operations during the downturn. Organisational learning belonged to the legacy alongside fibre and data facilities.[61]

FIG 5.6 **Amazon's selected quarterly trading ranges**



Source: Amazon, 1999 Form 10-K, fiscal year ended 31 December 1999; Amazon, 2001 Annual Report, fiscal year ended 31 December 2001. Note: Selected quarterly highs and lows use the filings' pre-2022-split basis. The approximate 95% decline is estimated as (1 − 5.97 / 113) × 100, not a total investor return.

Surviving equity, failed companies and cancelled shares gave investors different outcomes according to their claims, entry prices, financing and ability to adapt.

Comparing the cases and the frameworks

Across the three episodes, financial claims and useful assets followed different paths. Evaluating a government investment requires identifying both the claim the state holds and the domestic benefit it could retain after a write-down.

58 Romero, Economy's slump idles 95% of fiber-optic lines, 2001.
59 Couper, Hejkal and Wolman, Boom and Bust in Telecommunications, 2003.
60 Wikipedia contributors, WorldCom, n.d.
61 Amazon, 1999 Form 10-K, 1999; Amazon, 2001 Annual Report, 2001.

TABLE 5.1: TECHNOLOGY LEGACIES AND FINANCIAL LOSSES ACROSS THREE BOOMS

Case	Financial evidence	Useful legacy	Limit of the analogy
British Railway Mania	Broad share index fell about 67% ((1 – 672.1 / 2,017.4) × 100)	Routes, civil works, engineering and coordination	The index retained value; construction and permissions differ
Radio and electricity	RCA fell about 98% ((1 – $2.625 / $114.75) × 100); leveraged utility parents failed	Broadcasting skills, electric service and institutions	RCA survived; utilities and holding-company claims differ
Dot-com and telecom	Nasdaq fell about 78% ((1 – 1,114.11 / 5,048.62) × 100); some common equity was cancelled	Fibre, software, platforms and operating skills	A composite index is not a telecom portfolio; Amazon survived

Source: Odlyzko, Collective hallucinations and inefficient markets, 2010; Campbell and Turner, The Greatest Bubble in History, 2010; Taylor, RCA and the Roaring Twenties, 2023; US Bureau of the Census, Historical Statistics of the United States, chapters R and S, 1975; Nasdaq, NASDAQ Composite Index, n.d.; Couper, Hejkal and Wolman, Boom and Bust in Telecommunications, 2003; Amazon, 1999 Form 10-K, fiscal year ended 31 December 1999; Amazon, 2001 Annual Report, fiscal year ended 31 December 2001; Wikipedia contributors, Samuel Insull, n.d.; Wikipedia contributors, WorldCom, n.d.
Note: Approximate price-loss estimates use (1 – trough / peak) × 100. RCA endpoints and corporate-failure accounts are reported. A company share and two differently constructed indices do not form a comparable portfolio-return series. Price-loss labels are rounded to about 67%, 98% and 78%, respectively. No numerical share of surviving original assets is established.

Carlota Perez distinguishes financially led installation from wider deployment, emphasising the institutional changes that can connect the two. Her framework defines financial and production capital through functions and behaviours that can overlap. A turning point can permit broader productive use when institutional conditions support it.[62]

William Janeway's account of productive bubbles similarly allows experimentation to leave useful capabilities when investors' returns disappoint. Calling a bubble productive is a statement about consequences. Whether overpricing was necessary, losses were fairly allocated or alternative finance could have delivered the knowledge more cheaply requires a separate counterfactual and distributional assessment.[63]

William Quinn and John Turner's bubble triangle, as described in Fabio Natalucci's IMF review, combines marketability, money or credit, and speculation, with technological change or policy providing a spark. This helps explain how a genuine innovation can be surrounded by fragile finance. Odlyzko adds the importance of demand forecasts and the diversity of historical outcomes. Together these approaches favour examining financing structures and expectations rather than using technological usefulness as a valuation defence.[64,65]

The cost of losses and the availability of alternative finance remain open questions in each case. Evidence that later users benefited cannot establish what a less speculative build-out would have delivered.

Asset life changes the AI comparison

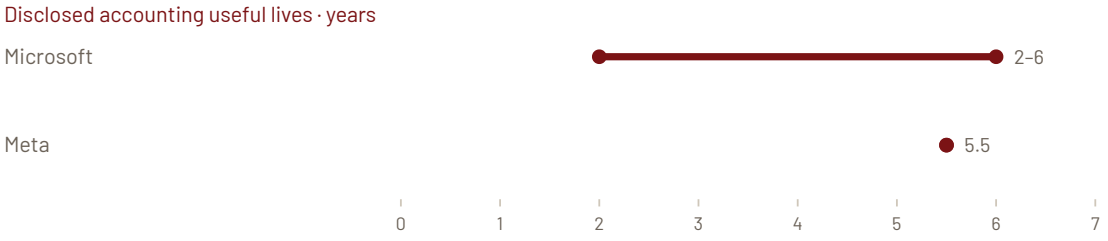
Railway corridors, rights of way, passive fibre and some civil works can remain useful for decades, with replacement of active equipment. The survival of a route does not imply the survival of original rails or original shareholders. AI infrastructure has a similarly layered structure, but the balance of expenditure across layers matters. A power connection, an adaptable building, cooling equipment, networking and an accelerator do not have the same replacement cycle.[66,67]

62 Perez, Technological Revolutions and Financial Capital, 2002.
63 Janeway, Productive Bubbles, 2015.
64 Quinn and Turner, Boom and Bust, 2020; Natalucci, Review of Boom and Bust, 2020.
65 Odlyzko, This time is different, 2010.
66 Odlyzko, Collective hallucinations and inefficient markets, 2010.
67 Couper, Hejkal and Wolman, Boom and Bust in Telecommunications, 2003.

Microsoft's disclosed accounting policy assigns servers and network equipment useful lives of two to six years. Meta extended the estimated lives of certain servers and network assets to 5.5 years. These are depreciation assumptions, not measured GPU resale half-lives or deadlines at which equipment stops functioning. They nevertheless show why a computing purchase should not inherit an undifferentiated infrastructure-life assumption. Buildings and power infrastructure can serve longer-lived functions while active compute needs repeated renewal.[68]

FIG 5.7 What survives a cycle: assets and accounting lives

Asset / basis / qualification		
Railway corridors and civil works	Qualitative long service across equipment generations	Historical network; not a measured original-asset survival share
Passive fibre and rights of way	Reusable across electronics generations	No universal numerical service life established
Microsoft servers and network equipment	Accounting useful life	Confirmed policy; not economic obsolescence or GPU resale life
Meta certain server and network assets	Accounting useful life	Confirmed policy; effective January 2025
Buildings and power infrastructure	Longer-lived functions than replaceable compute	Qualitative comparison; design demand and reuse matter



Source: Microsoft, 2026 Annual Report, 2026; Meta, Fourth Quarter and Full Year 2024 Results, 2025; Odlyzko, Collective hallucinations and inefficient markets, 2010; Couper, Hejkal and Wolman, Boom and Bust in Telecommunications, 2003. Note: Microsoft's two to six years and Meta's 5.5 years are estimated accounting useful lives, not GPU resale lives or guarantees of frontier competitiveness. Other asset comparisons are qualitative; blank cells indicate no established numerical lifetime.

Short-lived equipment can be a sound investment when utilisation and revenue arrive quickly. Long-lived assets can be poor investments when their location or design prevents reuse. Skills also require renewal and retention; a training programme has little domestic value if nobody uses the knowledge locally. The appropriate comparison is therefore the cost of maintaining usable capability over time, including electricity, replacement hardware, software, staff and access rights.

Is AI in a bubble now?

The financial evidence is consistent with high and uneven risk, without establishing that all AI assets are overpriced. Corporate investment is rising sharply. Microsoft's cash additions to property and equipment increased from $64.551 billion in its fiscal 2025 to $115.948 billion in fiscal 2026. Alphabet's calendar-2025 cash purchases were $91.447 billion, while Amazon's gross cash purchases were $131.819 billion. These are whole-company measures with different asset coverage, not AI-only public expenditure.[69]

68 Microsoft, 2026 Annual Report, 2026; Meta, Fourth Quarter and Full Year 2024 Results, 2025.
69 Microsoft, FY2026 Q4 Earnings Release, 2026; Microsoft, FY2026 Q4 Earnings Call, 2026; Alphabet, Q4 2025 earnings release, 2026; Amazon, Fourth Quarter Results, 2026; Amazon, Second Quarter Results, 2026.

Amazon's company guidance projected about $200 billion in calendar-2026 capital expenditure across the company. Meta's July guidance was $130–145 billion including finance-lease principal; CNBC reported Alphabet's updated guidance range at $195–205 billion. Microsoft's approximately $175 billion calendar-year guidance uses a lease-inclusive measure that differs from its fiscal-year cash series. These guidance figures describe expected full-year spending on their respective bases; half-year actuals cover only the observed six months.[70,71]

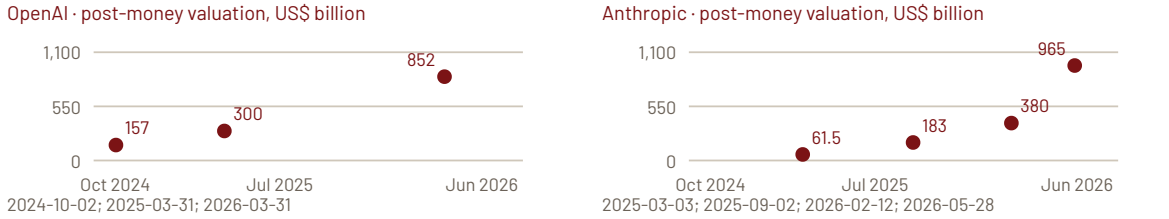
FIG 5.8 **Hyperscaler capital spending: actuals and dated guidance**

Filled: full-period actual. Hollow square: partial actual or guidance. Guidance is not expenditure.

Source: Microsoft, FY2025 Q4 cash flows, 2025; Microsoft, FY2026 Q4 Earnings Release, 2026; Microsoft, FY2026 Q4 Earnings Call, 2026; Alphabet, Q4 2025 earnings release, 2026; Alphabet, Q2 2026 earnings release, 2026; Amazon, Fourth Quarter Results, 2026; Amazon, Second Quarter Results, 2026; Meta, Q4 and full year 2025 earnings release, 2026; Meta, Second Quarter 2026 Results, 2026; CNBC, Google Q2 2026 earnings live updates, 2026. Note: Whole-company global spending, not AI-only. CY2026 figures are dated company guidance, not actual spending; Alphabet's updated guidance is reported by CNBC. H1 covers six months. Meta actuals are estimated sums of cash purchases and finance-lease principal: 69.691 + 2.524 = 72.215 and 49.113 + 1.805 = 50.918 (US$ billion). Microsoft's calendar guidance includes finance leases; its fiscal actuals are cash additions. Its lease reclassification lowered guidance without changing investment expectations. Company measures differ.

Private valuations create another exposure. OpenAI announced post-money valuations of $157 billion in October 2024 and $300 billion in March 2025. Its March 2026 final close reported $122 billion in committed capital at $852 billion post-money, expanding the earlier announcement of the same round. Anthropic's announced post-money valuations stepped from $61.5 billion in March 2025 to $183 billion that September, $380 billion in February 2026 and $965 billion in May. These are funding-event prices with specific terms, not continuously traded market capitalisations.[72]

FIG 5.9 **Private AI valuation steps at funding events**



Source: OpenAI, New funding to scale the benefits of AI, 2024; OpenAI, March Funding Updates, 2025; OpenAI, Accelerating the next phase of AI, 2026; Anthropic, Series E funding, 2025; Anthropic, Series F funding, 2025; Anthropic, Series G funding, 2026; Anthropic, Series H funding, 2026. Note: Announced post-money funding-event valuations, not continuous market prices or estimates of intrinsic value. OpenAI's March 2026 final close updates the earlier announcement of the same round. Funding commitments do not establish cash received on the announcement date.

70 Ibid.
71 Meta, Second Quarter 2026 Results, 2026; CNBC, Google Q2 2026 earnings live updates, 2026.
72 OpenAI, New funding to scale the benefits of AI, 2024; OpenAI, March Funding Updates, 2025; OpenAI, Accelerating the next phase of AI, 2026; Anthropic, Series E funding, 2025; Anthropic, Series F funding, 2025; Anthropic, Series G funding, 2026; Anthropic, Series H funding, 2026.

Investment and sales can also reinforce each other. In November 2025, Anthropic announced $30 billion in Azure compute commitments alongside prospective investments from Microsoft and Nvidia. Its April 2026 Amazon collaboration included announced spending commitments of more than $100 billion in AWS technologies over ten years, with new Amazon investment alongside earlier funding. Portions of previously committed hyperscaler investment are included in later rounds. Adding every announcement would double-count financing and conceal the overlap between supplier, investor and customer.[73]

The concern is correlated financing and demand. A supplier investing in a customer may help that customer purchase its services; expected sales can then support the supplier's own financing. Services can still be genuinely delivered. The critical question is whether external operating receipts eventually sustain the obligations if new equity becomes scarce. Minimum-purchase clauses, collateral, prepayments and cancellation rights determine who bears idle-capacity risk.

The IMF's October analysis reviewed fourteen transactions since 2023, identifying about $300 billion in equity, $650 billion in debt and $1.4 trillion in future revenue commitments. These categories cannot be added into an annual spending total or a loss estimate. The Bank of England's July assessment also warned that stretched valuations, concentration and more complex credit could amplify repricing, while acknowledging support from positive earnings. Dean Baker's July AI Bubble Monitor argues that valuations require very strong productivity gains or a larger profit share. [74,75,76]

Amazon reported quarterly AWS sales of $42.2 billion and operating income of $16.6 billion in the second quarter of 2026. Microsoft reported annual Azure revenue above $100 billion for fiscal 2026. These broad cloud businesses have established customers and operating scale. Anthropic's May announcement said its annualised revenue run-rate had exceeded $47 billion, while OpenAI's March account reported $2 billion in monthly revenue. Run-rates are not audited full-year sales or proof of adequate margins, but they contradict a claim that demand is absent.[77,78]

Revenue can grow while returns disappoint because capacity, competition or costs grow faster. Useful services can become cheaper as model suppliers lose pricing power. Governments should test each investment against these possibilities and resist using a technological success story to defend any entry valuation. Even a financially cautious state may fear that restraint will weaken its access to the technology.

73 Anthropic, Microsoft, NVIDIA, and Anthropic announce strategic partnerships, 2025; Anthropic, Amazon compute collaboration, 2026; Anthropic, Series H funding, 2026.
74 International Monetary Fund, Global Financial Stability Report, 2026; Vamvakidis and Wu, Global Financial Markets Face Rising Risks, 2026.
75 Bank of England, Financial Stability Report, July 2026, 2026.
76 Baker, AI Bubble Monitor, 2026.
77 Microsoft, FY2026 Q4 Earnings Release, 2026; Microsoft, FY2026 Q4 Earnings Call, 2026; Alphabet, Q4 2025 earnings release, 2026; Amazon, Fourth Quarter Results, 2026; Amazon, Second Quarter Results, 2026.
78 OpenAI, New funding to scale the benefits of AI, 2024; OpenAI, March Funding Updates, 2025; OpenAI, Accelerating the next phase of AI, 2026; Anthropic, Series E funding, 2025; Anthropic, Series F funding, 2025; Anthropic, Series G funding, 2026; Anthropic, Series H funding, 2026.

Part III: The Security Dilemma

Why restraint can look like vulnerability

Export controls and adaptation

Conditional access in the Arabian Gulf

Coordination without a binding investment pause

Part III: The Security Dilemma

Why restraint can look like vulnerability

John Herz's security dilemma describes how insecurity can encourage reciprocal accumulation of power even among states seeking security. Robert Jervis develops the conditions affecting cooperation, including the balance between offence and defence and whether their capabilities can be distinguished. AI complicates both distinctions. Computing and software useful for administration, logistics or research can also support intelligence and military applications. A rival cannot infer intentions from a capacity announcement alone.[79]

A government may consequently accelerate acquisition to avoid falling behind. Others can interpret that expansion as evidence that they need more capacity themselves. National-security claims can then protect projects from normal financial scrutiny. The pressure varies by application: a military system that fails under operational conditions is not improved by an earlier announcement.

A Berkeley panel account illustrates that qualification. Elsa Kania stressed AI's general-purpose uses rather than treating it as a single weapon, while Will Hunt's aviation research described cautious adoption in safety-critical settings. Tim Hwang emphasised utilisation capacity, including organisational, monetary, cultural and technical factors. Strategic value depends on whether an institution can use a system effectively. Trained operators and reliable procedures determine how much operational value the purchased hardware can deliver.[80]

For an Arabian Gulf state, this makes the security cost of restraint investment-specific. Losing the ability to defend critical networks, inspect sensitive systems or retain specialised teams could create a real vulnerability. Postponing an overpriced minority stake abroad has no automatic equivalent effect. A security argument for that stake should identify the access, rights or influence that would be lost, and whether a less costly contract could secure them.

Export controls and adaptation

US controls demonstrate that advanced compute access is political. Restrictions announced in October 2022, October 2023 and December 2024 targeted advanced computing, semiconductor production and diversion. The January 2025 AI Diffusion framework attempted a broader tiered system for international access. In May, the Commerce Department announced rescission and instructed officials not to enforce it, while describing formal rescission and replacement as subsequent steps. Other chip controls remained in force alongside that administrative reversal.[81]

Policy has continued to change. In January 2026, the Bureau of Industry and Security moved H200, AMD MI325X and similar exports to China to case-by-case review under conditions concerning US capacity, purchaser screening and independent testing. States planning infrastructure cannot assume that a particular licence policy will remain fixed throughout a project's life. Dependence arises from both supplier concentration and the legal authority governing delivery and continued support.[82]

79 Herz, Idealist Internationalism and the Security Dilemma, 1950; Jervis, Cooperation Under the Security Dilemma, 1978.
80 UC Berkeley Center for Long-Term Cybersecurity, AI Race(s) to the Bottom?, 2020.
81 US Bureau of Industry and Security, Foundry Due Diligence and Diversion to PRC, 2025; US Bureau of Industry and Security, Rescission of the AI Diffusion Rule, 2025.
82 US Bureau of Industry and Security, License Review Policy for Semiconductors Exported to China, 2026.

DeepSeek's December 2024 technical report documents open-model engineering, including its attention architecture and mixture-of-experts design. The report appeared after the earlier US controls. China's State Council subsequently set out models, compute, data, open-source ecosystems and talent as priorities in its AI Plus programme and software plan. Those plans state policy commitments and targets whose implementation remains to be assessed.[83]

Controls can affect access and reshape incentives without permanently fixing relative technological capability. A Gulf government should therefore maintain the expertise to reassess supplier options as rules and technical performance change. Dependence on a foreign partner can be managed through diversification and contractual rights, although complete self-sufficiency across the semiconductor and model stack is an unrealistic near-term planning assumption.

Conditional access in the Arabian Gulf

Microsoft's announced $1.5 billion minority investment into G42 in April 2024 came with board representation, an Azure partnership and a binding intergovernmental assurance agreement developed with the two governments. The direction of the capital matters: this was incoming US investment into the UAE. The associated security framework shows that cross-border collaboration can bundle commercial terms with governmental assurances; not all of those terms are public.[84]

OpenAI's May 2025 Stargate UAE announcement envisaged a one-gigawatt cluster, with an initial 200 megawatts expected in 2026. It sits inside the larger five-gigawatt UAE-US campus plan. These are nested plans, not additive installed capacities. The announcement explicitly involved US-government coordination. Actual operation remains subject to commissioning, while access depends on the governing arrangements for this local capacity.[85]

According to CNBC's November 2025 reporting, US authorities approved up to 35,000 Blackwell-equivalent chips for each of G42 and HUMAIN, subject to conditions. The reported approvals establish a diplomatic and procurement channel, not verified shipment or operational installation. A buyer still needs licences, power, a suitable facility, staff and a viable workload. Ordering accelerators ahead of those conditions can turn a bid for strategic access into an expensive idle inventory.[86]

These arrangements favour negotiating specific capabilities. A partnership can secure local operational responsibility, training, model adaptation and continuity arrangements. It can also lock an operator into a particular cloud or software stack. The security assessment should trace which functions remain available if a licence is delayed, a partner changes its terms or cross-border services are interrupted. An investment that increases headline capacity while reducing practical freedom to switch suppliers needs a higher burden of justification.

Coordination without a binding investment pause

International summits have created shared language and institutions, but no general reciprocal ceiling on AI investment. The Bletchley Declaration recognised international risks and cooperation. The Seoul commitments asked participating companies to set severe-risk thresholds, including conditional non-development or non-deployment if mitigation could not keep risks below them. Paris focused on inclusive and sustainable civilian AI, while the New Delhi Declaration stressed access, skills, science and trusted systems. The UN Global Digital Compact provides a further framework for cooperation and capacity-building.[87]

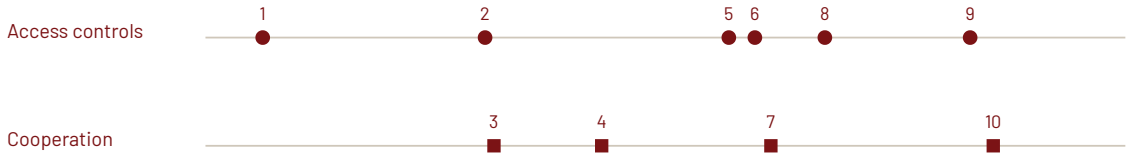
Such arrangements can make restraint safer when they produce useful evaluation methods, incident information or confidence about other actors' conduct. Chip-supply guarantees and military-AI obligations would require separate agreements

83 DeepSeek, DeepSeek-V3 README, 2024; State Council / China Daily, AI Plus integration, 2025; State Council / Xinhua, AI and the software sector, 2026.
84 Microsoft, Microsoft and G42 partner, 2024; Microsoft, Investment in Abu Dhabi's G42, 2024.
85 G42, 5GW UAE-US AI Campus, 2025; OpenAI, Introducing Stargate UAE, 2025.
86 CNBC, U.S. approves AI chip exports to Gulf, 2025.
87 UK Government, Bletchley Declaration, 2023; UK Government, Frontier AI Safety Commitments, 2024; Élysée, Inclusive and Sustainable Artificial Intelligence, 2025; Government of India, New Delhi Declaration, 2026; United Nations, Global Digital Compact, 2024.

beyond these voluntary safety commitments and civilian declarations. States still face uncertainty about rivals and suppliers, so simply recommending that everyone slow down leaves the practical collective-action problem unresolved.

FIG 6.1 **Export controls and international AI coordination**

Access controls / cooperation · dated announcements



1. 2022-10-07 · US advanced-compute restrictions — Announced
2. 2023-10-17 · US controls update — Announced
3. 2023-11-01 · Bletchley Declaration — Cooperation not an investment ceiling
4. 2024-05 · Seoul commitments — Conditional company safety commitments
5. 2024-12-02 · US controls update — Announced
6. 2025-01-15 · AI Diffusion framework — Issued; compliance planned for May
7. 2025-02-11 · Paris statement — Civilian cooperation without spending ceiling
8. 2025-05-13 · Diffusion rescission announced — Non-enforcement directed; formal steps to follow
9. 2026-01-13 · China chip licence policy revised — Case-by-case review subject to conditions
10. 2026-02-21 · New Delhi Declaration release — Capacity and trusted-AI cooperation

Source: US Bureau of Industry and Security, Foundry Due Diligence and Diversion to PRC, 2025; US Bureau of Industry and Security, Rescission of the AI Diffusion Rule, 2025; US Bureau of Industry and Security, License Review Policy for Semiconductors Exported to China, 2026; UK Government, Bletchley Declaration, 2023; UK Government, Frontier AI Safety Commitments, 2024; Élysée, Inclusive and Sustainable Artificial Intelligence, 2025; Government of India, New Delhi Declaration, 2026. Note: May 2025 marks the rescission announcement and non-enforcement direction; formal steps were to follow. Other controls remained. Summit declarations and conditional company commitments establish neither an investment ceiling nor chip-supply guarantees. The New Delhi date is the declaration's release date.

A workable Gulf policy would protect security-critical capability while varying the timing and composition of other commitments. Cyber defence and secure local operations may need sustained funding. New equipment can wait for power readiness and authorised access. Foreign financial stakes can wait for acceptable terms. Research teams can continue learning during a hardware delay by using shared or contracted capacity. This preserves options while assigning each category a timetable appropriate to its operational urgency.

Foreign partnerships can strengthen a state's ability to use, evaluate and adapt AI through commercial or political disruption. Concentrating public resources in expensive claims with little operating control can weaken it. Domestic learning and usable access need contractual deliverables against which governments can assess continued funding.

06 Conclusion and Recommendations

What public money should secure

Financial stakes need financial accounts

Lessons from states that acquired know-how

Investment conditions, transfer terms and safety safeguards

Conclusion and Recommendations

What public money should secure

Governments should continue competing in AI, especially where participation protects services, security and the ability to absorb technical change. They should redirect marginal public resources toward assets, knowledge and know-how that remain usable through a financial cycle. For the Middle East and Arabian Gulf, the priority is an investment programme that leaves domestic teams able to operate systems, govern data, develop Arabic applications and negotiate effectively with external suppliers.

Selective restraint must address safety as well as price. The International AI Safety Reports document misuse, malfunction and systemic risks amid disagreement about future loss of control. A financially attractive programme can still require a pause if its severe risks cannot be adequately mitigated. The Seoul commitments supply a relevant principle: define intolerable-risk thresholds and withhold development or deployment when mitigation cannot keep residual risk below them. Applying that principle requires evidence about the particular system, its intended use and the safeguards available, alongside financial appraisal.[88,89]

The Arabian Gulf already has a mixed portfolio. MGX Fund I announced a final close of $49 billion in total commitments in July 2026, with international investors; the UAE government's share and paid-in amount are undisclosed. MGX and QIA participate in major foreign funding rounds, but the full round sizes cannot be attributed to either vehicle. According to HUMAIN's announcement and corroborating reporting, its investment in xAI's Series E was $3 billion. That is an investor-specific reported exposure within the wider round.[90]

Infrastructure announcements describe other forms of commitment. HUMAIN and AMD announced a planned up-to-$10 billion collaboration spanning Saudi Arabia and the United States. HUMAIN and AWS announced a joint Saudi AI Zone plan of more than $5 billion, alongside a training target for 100,000 Saudi citizens. Qai and Brookfield's announced $20 billion partnership plan covers Qatar and selected international markets. These are joint or mixed-location envelopes, not comparable Saudi or Qatari public disbursements.[91]

Domestic institutions and models also form part of the portfolio. WAM reported the establishment of MBZUAI in 2019. TII released Falcon 40B in 2023; Inception, MBZUAI and Cerebras collaborated on Jais that year. Saudi Arabia's ALLaM became available on IBM watsonx in 2024, and Qatar launched Fanar through its research and government institutions later that year. The launches document local research, adaptation and institutional activity across the region.[92]

Available disclosures do not support a reliable estimate of the share of Gulf public AI money allocated to foreign finance versus domestic capability. Research spending remains partly undisclosed, while infrastructure envelopes combine several investors and obligations. Comparable accounts of public commitments and payments would make portfolio composition assessable.

88 International AI Safety Report, International AI Safety Report 2025, 2025; International AI Safety Report, International AI Safety Report 2026, 2026.

89 UK Government, Bletchley Declaration, 2023; UK Government, Frontier AI Safety Commitments, 2024; Élysée, Inclusive and Sustainable Artificial Intelligence, 2025; Government of India, New Delhi Declaration, 2026; United Nations, Global Digital Compact, 2024.

90 MGX, Final close of MGX Fund I, 2026; QIA, Anthropic Series H investment, 2026; OpenAI, Accelerating the next phase of AI, 2026; HUMAIN, Frontier AI investment in xAI, 2026; CNBC, Humain's xAI Series E investment, 2026.

91 AMD, AMD and HUMAIN collaboration, 2025; AWS, AWS and HUMAIN AI Zone, 2025; QIA, Brookfield and Qai partnership, 2025.

92 WAM, Establishment of MBZUAI, 2019; TII, Falcon 40B launch, 2023; G42, Meet Jais, 2023; IBM, SDAIA launches Arabic AI model, 2024; HBKU, Fanar launch, 2024.

FIG 7.1 **Arabian Gulf investment categories and disclosure limits**

Selected projects · categorical matrix; no spending shares

	Foreign equity / funds	Infrastructure	Skills / research / models	Incoming / mixed location
UAE	MGX MGX Fund I US$49bn total fund commitments final close Confirmed	G42 OpenAI and partners Stargate UAE 1000 MW (planned) planned Confirmed	TII under ATRC Falcon 40B model released Confirmed	Microsoft into G42 G42 minority investment US$1.5bn incoming equity announced Confirmed
Saudi Arabia	HUMAIN PIF company xAI Series E US$3bn announced investor specific investment announced investment Reported	HUMAIN and Nvidia AI factories 500 MW (planned) up to five year plan Confirmed	SDAIA and IBM ALLaM on watsonx platform deployment Confirmed	HUMAIN and AMD AI infrastructure collaboration up to US$10bn up to joint investment five year plan Confirmed
Qatar	QIA Anthropic Series H US$65bn total funding round third consecutive round Confirmed	Undisclosed / not verified	QCRI HBKU and MCIT Fanar model launched Confirmed	Qai and Brookfield AI infrastructure JV US$20bn joint venture envelope announced Confirmed

Source: MGX, Final close of MGX Fund I, 2026; OpenAI, Introducing Stargate UAE, 2025; TII, Falcon 40B launch, 2023; Microsoft, Investment in Abu Dhabi's G42, 2024; HUMAIN, Frontier AI investment in xAI, 2026; CNBC, Humain's xAI Series E investment, 2026; NVIDIA, HUMAIN and NVIDIA AI factories, 2025; IBM, SDAIA launches Arabic AI model, 2024; AMD, AMD and HUMAIN collaboration, 2025; Qatar Investment Authority, Anthropic Series H investment, 2026; HBKU, Fanar launch, 2024; Qatar Investment Authority, Brookfield and Qai partnership, 2025. Note: Announced amounts, not public disbursements; capacity figures are plans or targets. HUMAIN's $3 billion xAI stake is reported. MGX Fund I is an all-investor envelope; Anthropic's round total is not QIA's cheque. AMD/HUMAIN and Qai/Brookfield amounts are joint, mixed-location plans. Microsoft's G42 investment is incoming US capital. Stargate UAE's 1GW sits within the 5GW campus, with the first 200MW planned inside that 1GW. Blank cells indicate undisclosed or unverified amounts, not zero. No local/foreign spending-share denominator is established.

Lessons from states that acquired know-how

ITRI's account identifies what crossed into Taiwan's semiconductor institutions: a 1976 technology-transfer arrangement with RCA, training for nineteen engineers in design, manufacturing, verification and equipment, and a demonstration line in 1977. The later spinoffs transferred researchers and wafer technology to UMC; in 1987, fabs, equipment, technologies and 98 professionals went to TSMC. The institution's own history specifies the teams and production assets transferred.[93]

Commercial deployment provides a different endpoint in South Korea. A government-backed digital-mobile project began in 1989; ETRI agreed joint CDMA development with Qualcomm in 1991, followed by successful commercialisation in 1996. Foreign collaboration fed into domestic engineering and implementation. Contemporary official R&D statistics describe substantial private participation in the wider research system, extending the financing base beyond government support.[94]

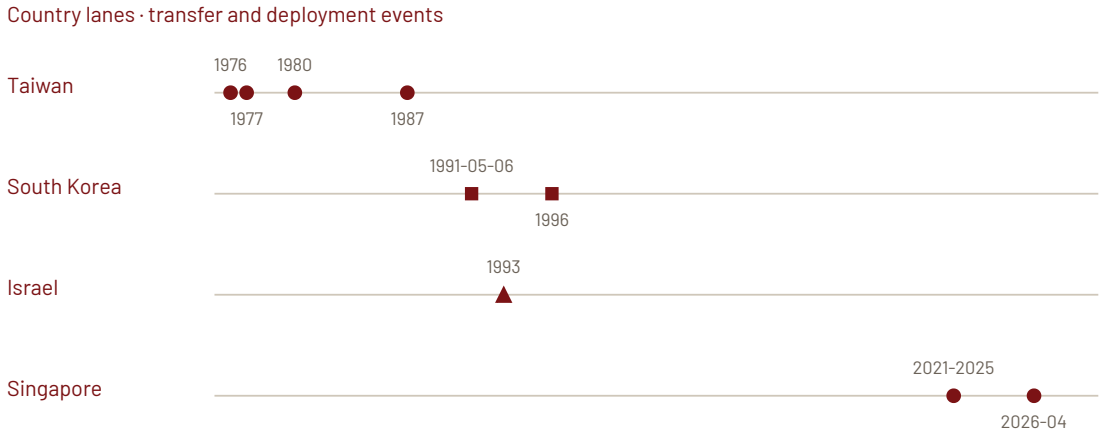
93 ITRI, The Birth of Taiwan's Semiconductor Industry, 2023; ITRI, 50th Anniversary: Semiconductors, 2023.
94 ETRI, World's First Commercialization of CDMA, 2021; IEEE, Large-Scale Commercialization of CDMA, 2024; Korea.net, GDP-to-R&D investment ratio, 2025.

Finance was the instrument in Yozma. Its sponsor dates the Israeli government-origin programme to 1993 and describes ten funds established over time, direct startup investments and commercialisation links.[95]

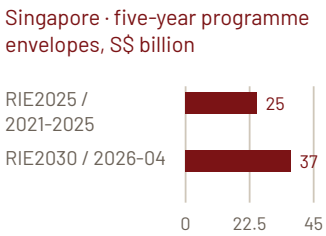
Those channels could develop domestic managers, networks and firms alongside financial returns. The sponsor's retrospective identifies the mechanisms, but an independent estimate of their contribution would require further evidence.

Singapore's commitments fund a continuing research system. The S$25 billion RIE2025 envelope supported research, talent and enterprise innovation, with scientist and engineer secondments through T-Up and equipment access. RIE2030 commits S$37 billion over five years from April 2026. Both cover activities well beyond AI. Secondments and equipment access specify routes from public institutions into enterprise work; the later plan's productivity returns remain to be established.[96]

FIG 7.2 **Capability-building through transfer, institutions and deployment**



Taiwan / 1976 · engineers sent for training · 19 people · technology transfer project
Taiwan / 1977 · first IC production line · 1 production_line · demonstration factory
Taiwan / 1980 · wafer technology transferred · 4 inches · spin off
Taiwan / 1987 · professionals transferred · 98 people · spin off
South Korea / 1991-05-06 · joint development agreement · CDMA development
South Korea / 1996 · successful commercial CDMA service · commercialization
Israel / 1993 · drop down funds · 10 funds · formed over time



Source: ITRI, The Birth of Taiwan's Semiconductor Industry, 2023; ETRI, World's First Commercialization of CDMA, 2021; IEEE, Large-Scale Commercialization of CDMA, 2024; Yozma Group, Overview, n.d.; NRF, RIE2025 Goals and Priorities, 2022; NRF, RIE2030 Plan, 2025. Note: Institutional accounts and commitments, not causal estimates of programme effects. Taiwan's 19 engineers and 98 professionals refer to different transfers; four inches describes wafer technology. Yozma's ten funds formed over time. Singapore amounts are five-year commitments for the wider innovation system, not annual or AI-only expenditure.

The evidence differs across these cases: transfer histories name people and productive assets, commercialisation accounts trace deployment, and funding plans identify commitments whose future effects remain open. Institutional self-reporting and the selection of successful cases limit estimates of what another country would earn. Gulf agreements can nevertheless specify observable deliverables, such as engineers trained for local work, process knowledge, equipment access or research entering a domestic firm, before assigning a strategic premium.

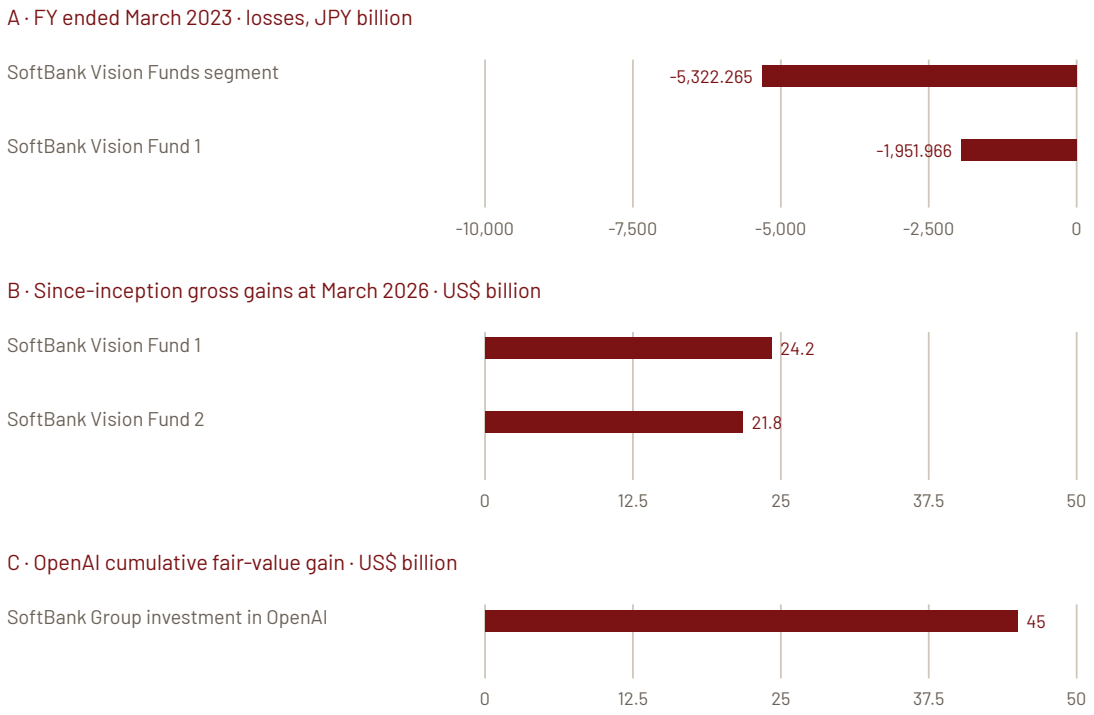
95 Yozma Group, Overview, n.d.; Yozma Group, Yozma, n.d.
96 Singapore National Research Foundation, RIE2025 Goals and Priorities, 2022; Singapore National Research Foundation, RIE2030 Plan, 2025.

Financial stakes need financial accounts

SoftBank's accounts record severe markdowns and later gains on different fund and group bases. Mubadala committed $15 billion and PIF up to $45 billion to Vision Fund 1 in 2017. Those broad-technology commitments are not an AI-only annual budget. The wider Vision Funds segment loss covered other funds as well and cannot be assigned to Gulf investors. In the fiscal year ended March 2023, SVF1 reported approximately ¥1,951.966 billion in net unrealised valuation losses (¥782.582 billion + ¥1,169.384 billion) alongside ¥81.714 billion in net realised investment gains.[97]

At March 2026, SoftBank reported since-inception gross gains of $24.2 billion for SVF1 and $21.8 billion for SVF2. Separately, its group-level OpenAI investment had a reported fair value of $79.6 billion against cumulative investment of $34.6 billion, a $45 billion fair-value gain ($79.6 billion – $34.6 billion). These figures include valuation gains rather than realised cash proceeds. SVF2 and group-level gains are not identified returns to PIF or Mubadala.[98]

FIG 7.3 **SoftBank markdowns and later reported gains**



Source: SoftBank Group, Consolidated Financial Report, year ended March 2023, 2023; SoftBank Group, Consolidated Financial Report, year ended March 2026, 2026. Note: The SVF1 unrealised markdown is an estimated sum: 782.582 + 1,169.384 = 1,951.966 (JPY billion). It is a subset of the Vision Funds segment loss. The OpenAI fair-value gain is calculated as 79.6 – 34.6 = 45.0 (US$ billion). Later gains include unrealised values. Gross fund and group gains are not Gulf investors' net returns; SVF2 and group-level OpenAI gains are separate from SVF1.

A Gulf limited partner's net return requires an account of paid-in timing, distributions, fees and contractual terms across the investment's life. Equity stakes are risky financial bets that can earn gains; they should be judged by valuation, liquidity, concentration and downside exposure. A separate account should record any domestic learning or access they secure. Combining those accounts allows an investment to evade both tests: a poor return can be called strategic, while a weak capability result can be defended by an unrealised valuation.

97 Mubadala, Commitment to the Softbank Vision Fund, 2017; PIF, Vision Fund initial investors, 2017; SoftBank Group, Consolidated Financial Report, year ended March 2023, 2023.
98 SoftBank Group, Consolidated Financial Report, year ended March 2026, 2026.

Investment conditions, transfer terms and safety safeguards

1. Separate the mandates and accounts. Public budgets and sovereign vehicles should distinguish commercial equity, infrastructure services, research, skills and security-critical operations. Report commitments, paid-in amounts and contingent liabilities separately. Every investment with a strategic justification should identify the domestic beneficiary, the rights obtained and the evidence that would show delivery. Financial return and public capability should have separate assessments, even where one transaction pursues both.

2. Stage GPU purchases against power, demand and licences. Approve successive hardware orders only when the relevant facility, authorised access and workload are ready. Demand tests should distinguish firm external customers from affiliated buyers funded by the same investment network. Evaluate the full replacement cycle and operating costs, including cooling and software. Preserve the option to resize or switch equipment.

3. Contract for transfer and training. Partnerships should specify local engineering responsibilities, supervised operational work, research participation and access to appropriate documentation. Training assessments should distinguish participation from demonstrated competence and retention in operational work. Where intellectual-property protection limits disclosure, define the operational tasks that domestic staff must still be able to perform. Technology-transfer claims should identify rights and deliverables that survive changes in the partner's ownership or commercial priorities.

4. Build Arabic data and model capability around usable rights. Fund lawful data access, quality control, evaluation and domain expertise alongside model development. Agreements should address adaptation, deployment, portability and the continued use of outputs or derivatives where legally available. Procurement should reward reliable performance on public-service tasks rather than model size alone. Shared research assets can help domestic firms without forcing every institution to train a separate frontier model.

5. Stress-test foreign stakes and long compute commitments together. Model slower receipts, weaker margins, refinancing difficulty, lower utilisation and commissioning delays. Examine preference terms, guarantees, minimum purchases, termination rights and the concentration of customers and suppliers. Map overlapping obligations so that a fund investment, a data-centre guarantee and a compute reservation do not conceal one correlated exposure. A strategic label should not waive a valuation or liquidity test.

6. Protect security-critical capability through disruption. Maintain the teams and secure access needed for cyber defence, sensitive public operations and independent evaluation. Establish continuity arrangements and assess supplier portability before dependence becomes costly to reverse. Review whether proposed foreign shareholdings genuinely improve these capabilities. Where access can be secured through a service agreement or research partnership, compare that route explicitly with buying equity.

7. Give durable assets and institutions performance-based support. Prioritise power, connectivity and adaptable data-centre shells where demand and alternative uses justify them. Sustain research institutions and talent pathways while testing quality, local use and collaboration with domestic firms. Independent reviews should be able to stop an underused facility or ineffective programme without dismantling the wider national effort.

8. Use cooperation to reduce the cost of restraint. Support reciprocal testing, incident reporting and practical access assurances, including regional research and evaluation capacity. Pair cooperation with binding procurement and financing terms, backed by domestic expertise and credible alternative partners.

9. Make severe-risk thresholds a condition of funding and deployment. Require a programme-specific safety appraisal, access to independent testing and a documented mitigation plan. Where evaluation finds risks at or above the defined intolerable threshold and effective mitigation is unavailable, pause the affected development or deployment, even if its financial return and domestic usefulness are attractive. Further funding should depend on evidence that residual risks fall below that threshold, with reassessment when capabilities, uses or safeguards change. Assign the stop decision to a body able to challenge the programme sponsor,

record the evidence needed to reopen it and preserve evaluation capacity while deployment is withheld. This recommendation applies the Seoul conditional non-development and non-deployment principle, informed by the International AI Safety Reports; it is a proposed public-funding rule, not an existing general investment ceiling.[99,100]

Governments should slow commitments whose price, rigidity or exposure cannot be justified, and pause or condition activities whose severe safety risks cannot be adequately mitigated. For the Arabian Gulf, each programme should identify what local institutions will be able to operate and improve, the rights they will retain, and the financial and safety conditions that would stop further funding.

99 International AI Safety Report, International AI Safety Report 2025, 2025; International AI Safety Report, International AI Safety Report 2026, 2026.

100 UK Government, Bletchley Declaration, 2023; UK Government, Frontier AI Safety Commitments, 2024; Élysée, Inclusive and Sustainable Artificial Intelligence, 2025; Government of India, New Delhi Declaration, 2026; United Nations, Global Digital Compact, 2024.

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