

RBI Research Forum – AI in Financial Markets – Keynote Speech

Between Path Dependency and Investor Exuberance?

Vienna, 12 November 2024

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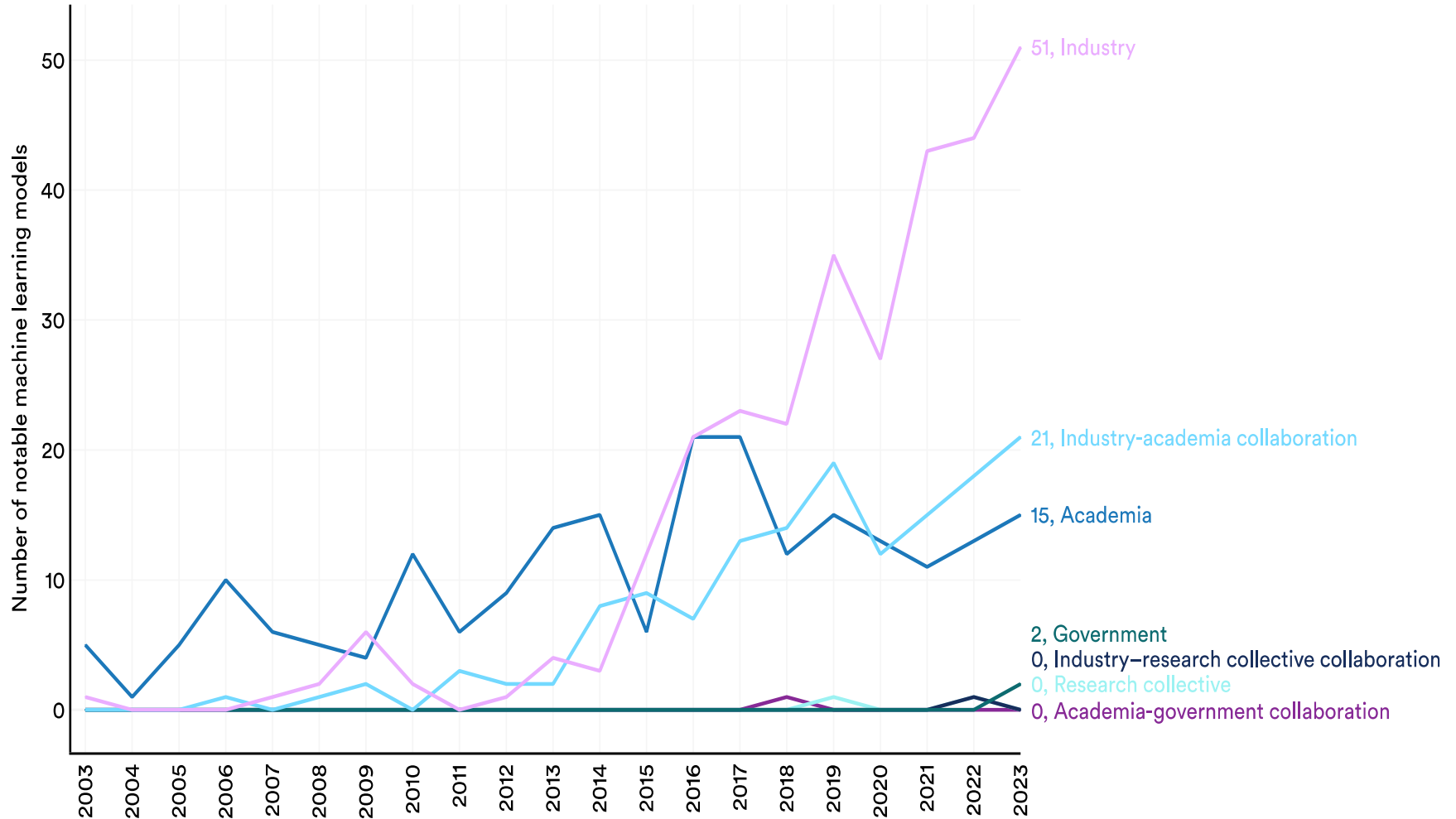
Early takeaways from AI revolution

- **AI beats humans** on some tasks BUT NOT ON ALL
 - Image classification, visual reasoning and English understanding
- INDUSTRY continues to **dominate frontier AI research**
- The **United States leads** China, the EU and UK as **source of top AI models**
 - 2023: 61 notable models from US, 21 from EU and 15 from China
- Generative AI investment SKYROCKETS
 - 2023: \$25.2bn or 8x more than in 2022 (OpenAI, Anthropic)
- AI makes workers MORE PRODUCTIVE, leads to **higher work quality**
- SCIENTIFIC PROGRESS **accelerates** – thanks to AI – **even further**

Industry dominates frontier AI research

Number of notable machine learning models by sector, 2003–23

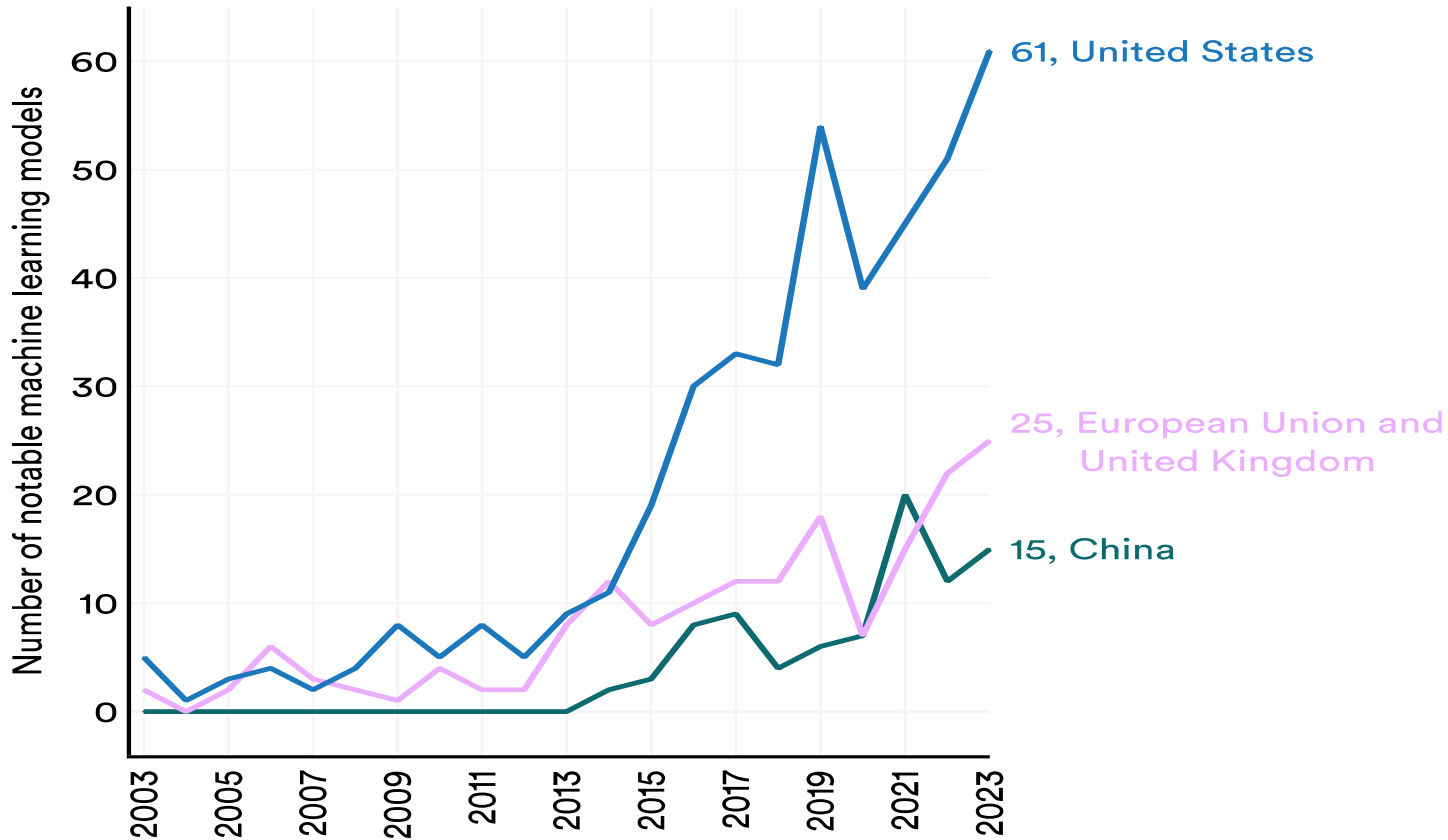
Source: Epoch, 2023 | Chart: 2024 AI Index report



The US leads as source of top AI models

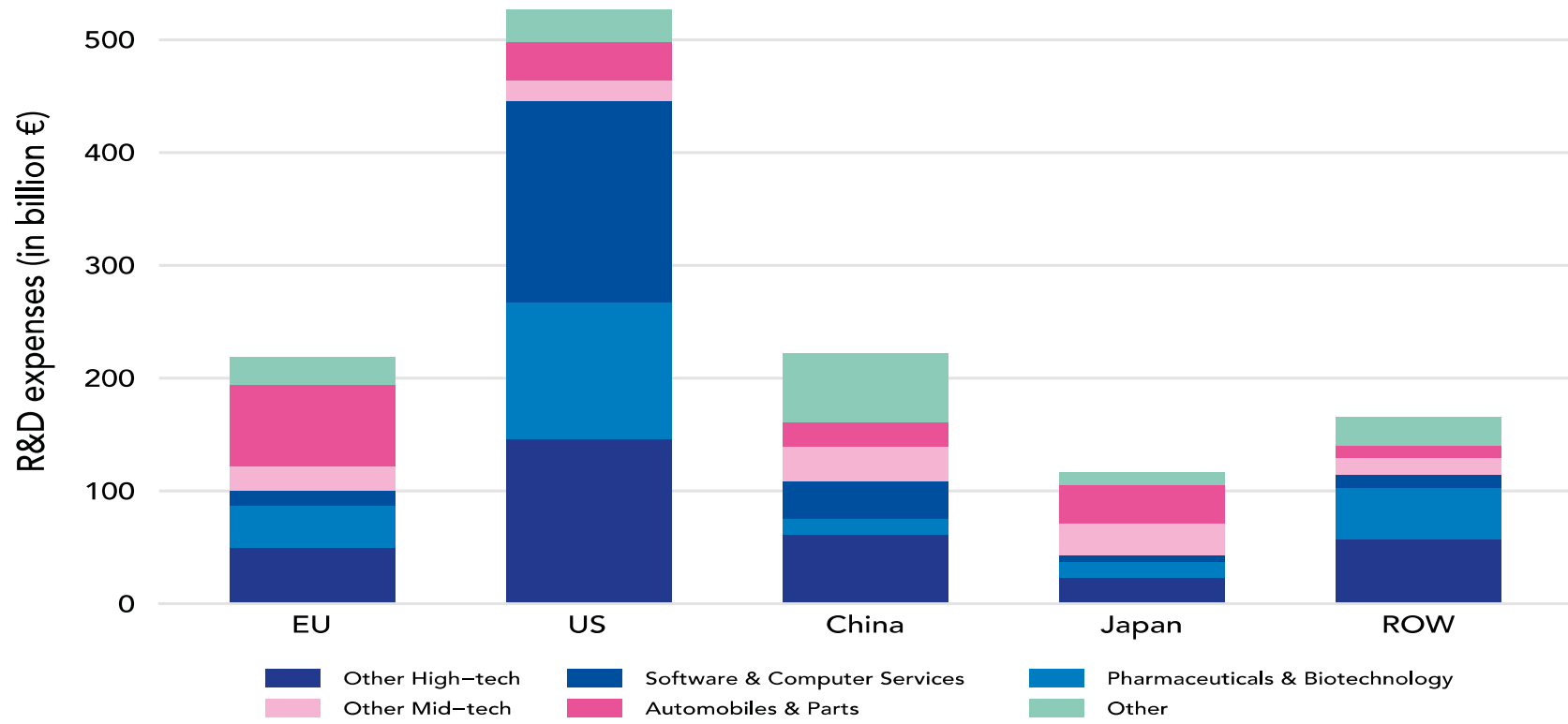
Number of notable machine learning models by select geographic area, 2003–23

Source: Epoch, 2023 | Chart: 2024 AI Index report



Europe in middle-technology trap?

BERD by technology level 2022 (Top 2,500 companies)



Source: Industrial R&D Investment Scoreboard (2023).

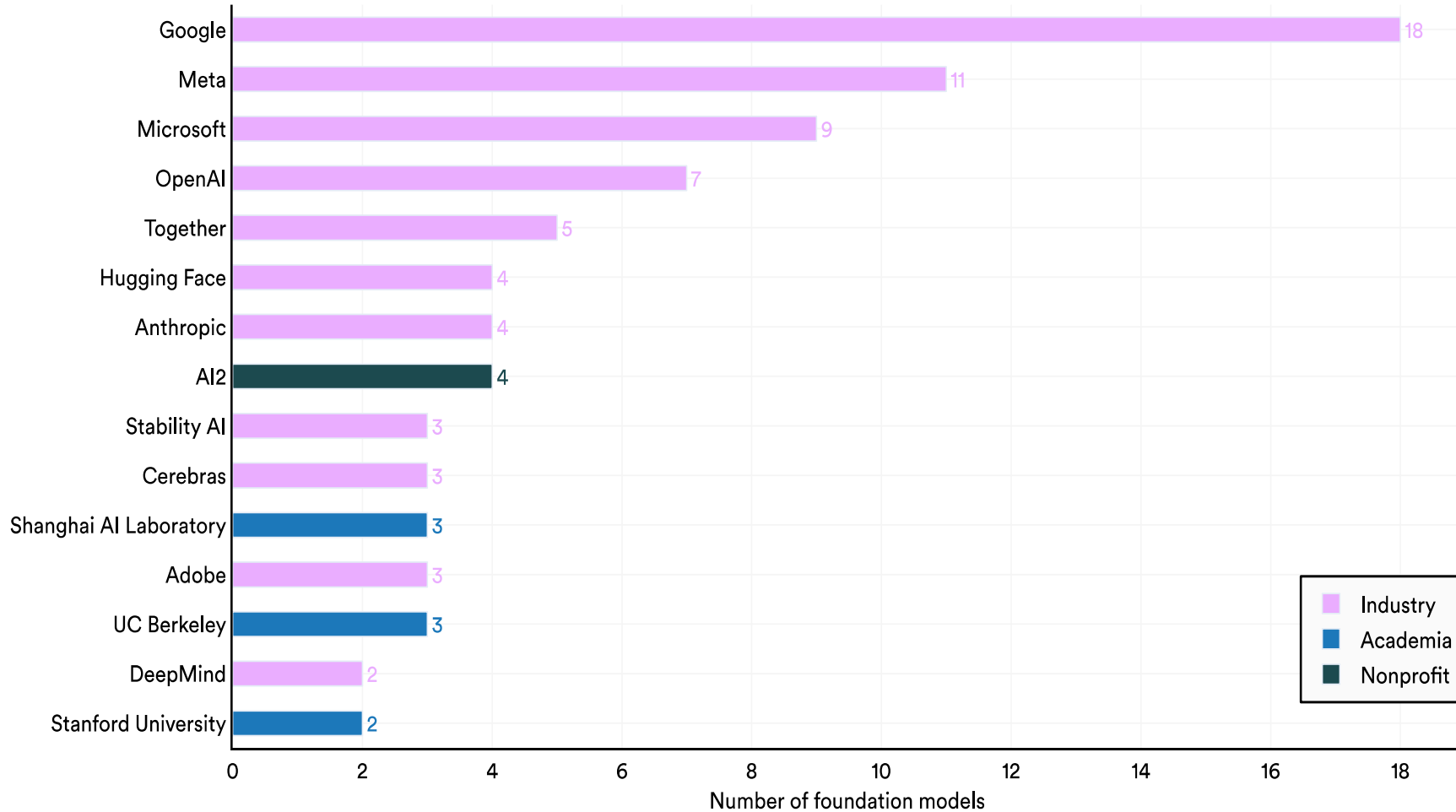
Betting on the sure things?

- Clear **preference for the behemoths** of BIG TECH (“Magnificent Seven”)
 - Apple, Microsoft, Alphabet, Amazon, Nvidia, Tesla and Meta
 - NARRATIVE: *“If anyone wins the AI race, it will be these companies.”*
 - Presumption of **dominant players still around** in 10 years’ time
- Potential PARADIGM SHIFT for **active (good) stockpickers**
 - AI to **improve productivity**, easier to disrupt entrenched models
 - Massive investments into LLM and infrastructure (data centres)
 - BUT: it simply takes time to **put all the capacity into productive use**
- Detect REAL USE CASES with **financial impact on major companies?**
 - High training costs of AI models correlate with computational power
 - AI has **not yet led to compelling** new services (cell phone, AI PCs)

US mega caps dominate foundation models

Number of foundation models by organization, 2023

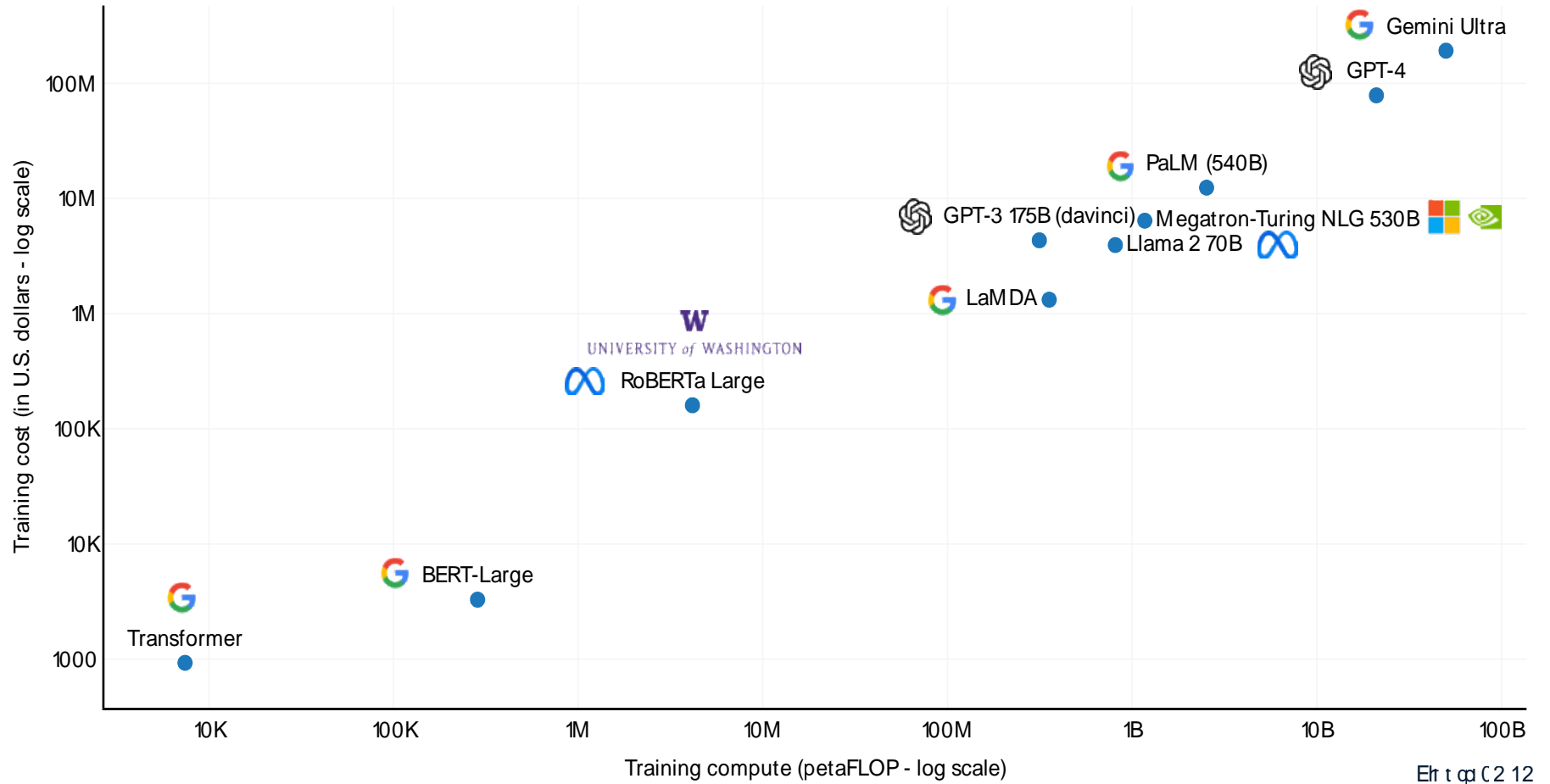
Source: Bommasani et al., 2023 | Chart: 2024 AI Index report



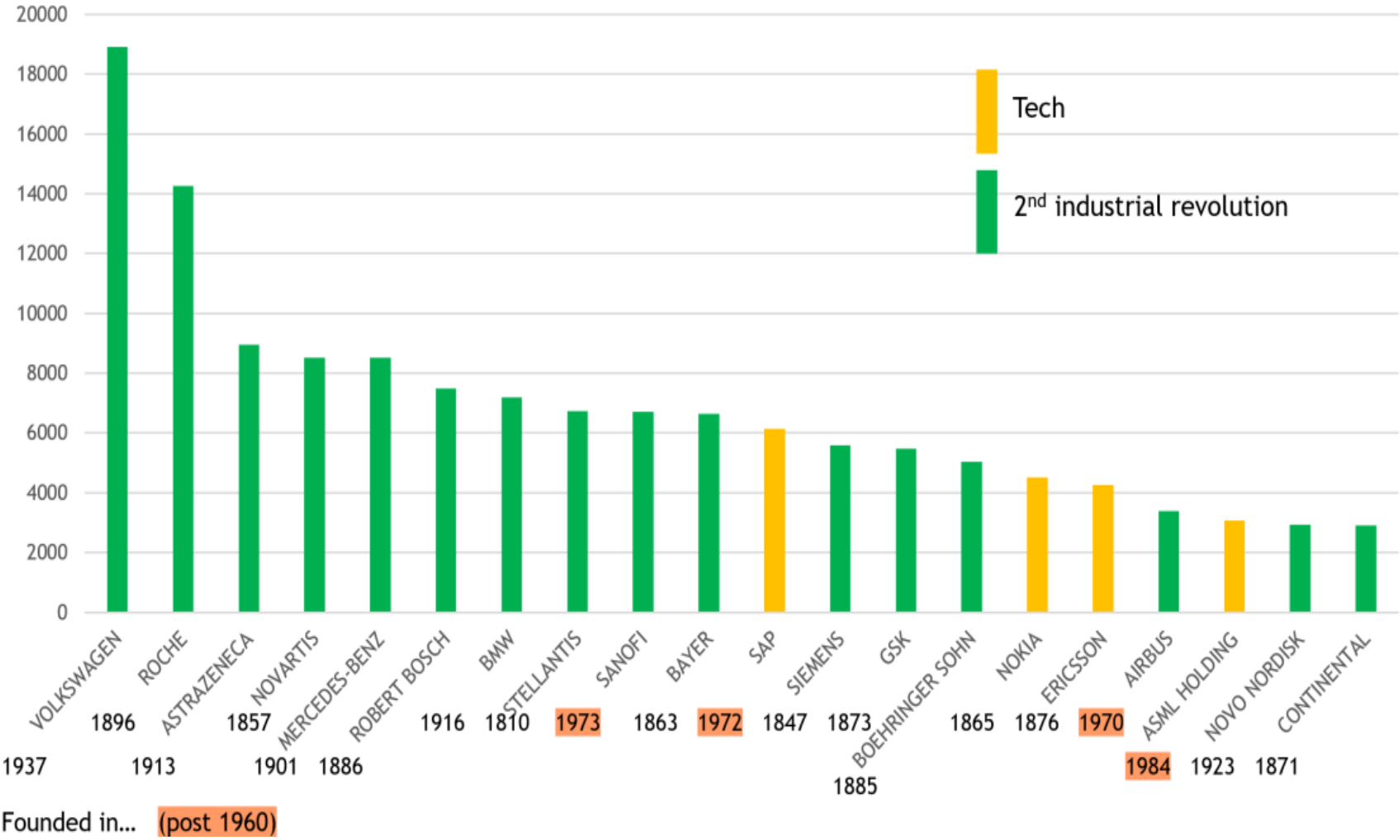
Training costs vs computational requirements

Estimated training cost and compute of select AI models

Source: Epoch, 2023 | Chart: 2024 AI Index report



European leading investors in R&D, €mn, 2022



Yann Coatanlem, Oliver Coste "Cost of failure and competitiveness in disruptive innovation, IEP@ BU Policy Brief September 2024, p.13

AI frenzy – separating hype from real potential

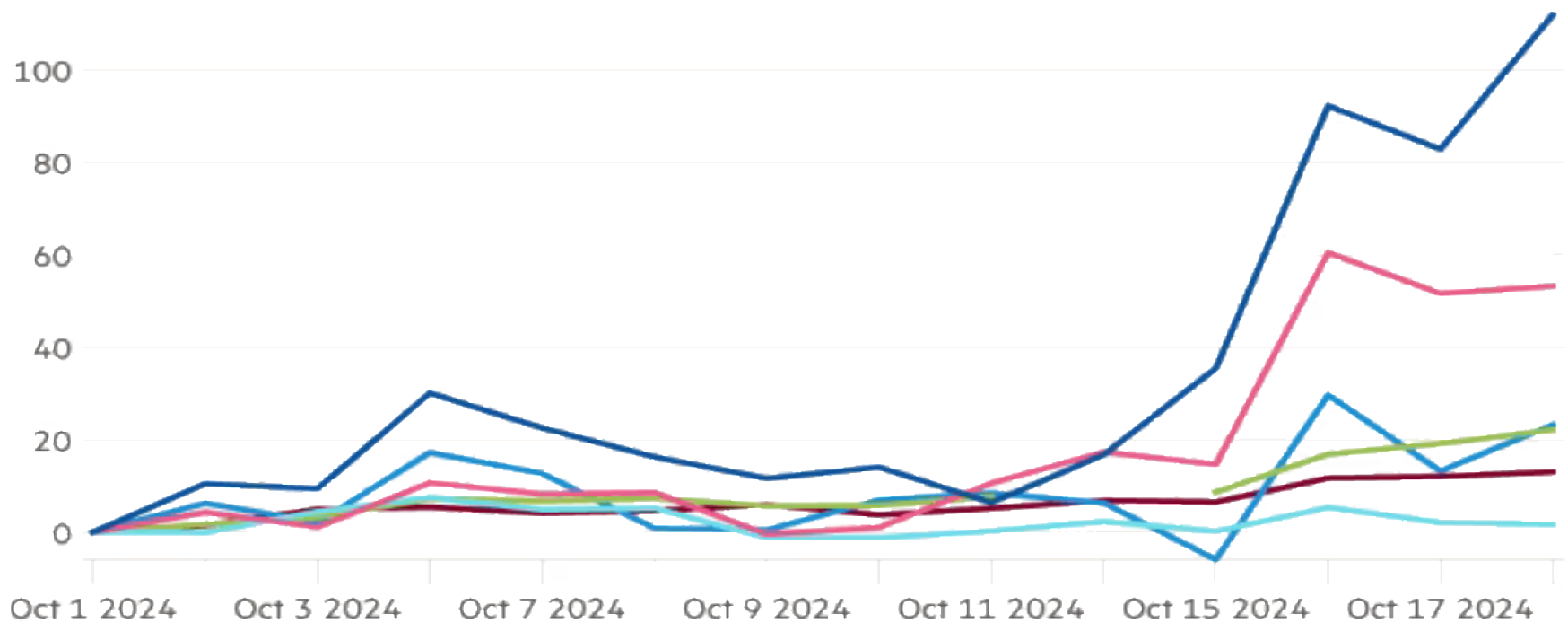
- SUSTAINABILITY of AI investments with **no tangible returns yet?**
 - Challenges in terms of costs (energy, water, land)
 - Concentration/competition and ethical risks
 - Institutional resistance (defence, healthcare)
- KEY DISCUSSION THEMES in current investor debate
 - **More of a problem than a solution** when it comes to CLIMATE CHANGE (massive energy and water usage)?
 - **Undermining evaluation criteria** to assess performance, ACCURACY and SAFETY (too easy to manipulate)?
 - OMNIPRESENCE of big US companies leading to fears about „techno-feudalism“ and „data colonialism“

Nuclear energy to power AI?

Nuclear stocks have rallied

Change in share price since Oct 1, 2024 (%)

Oklo NuScale Power Constellation Energy Cameco
NANO Nuclear Energy BWX Technologies



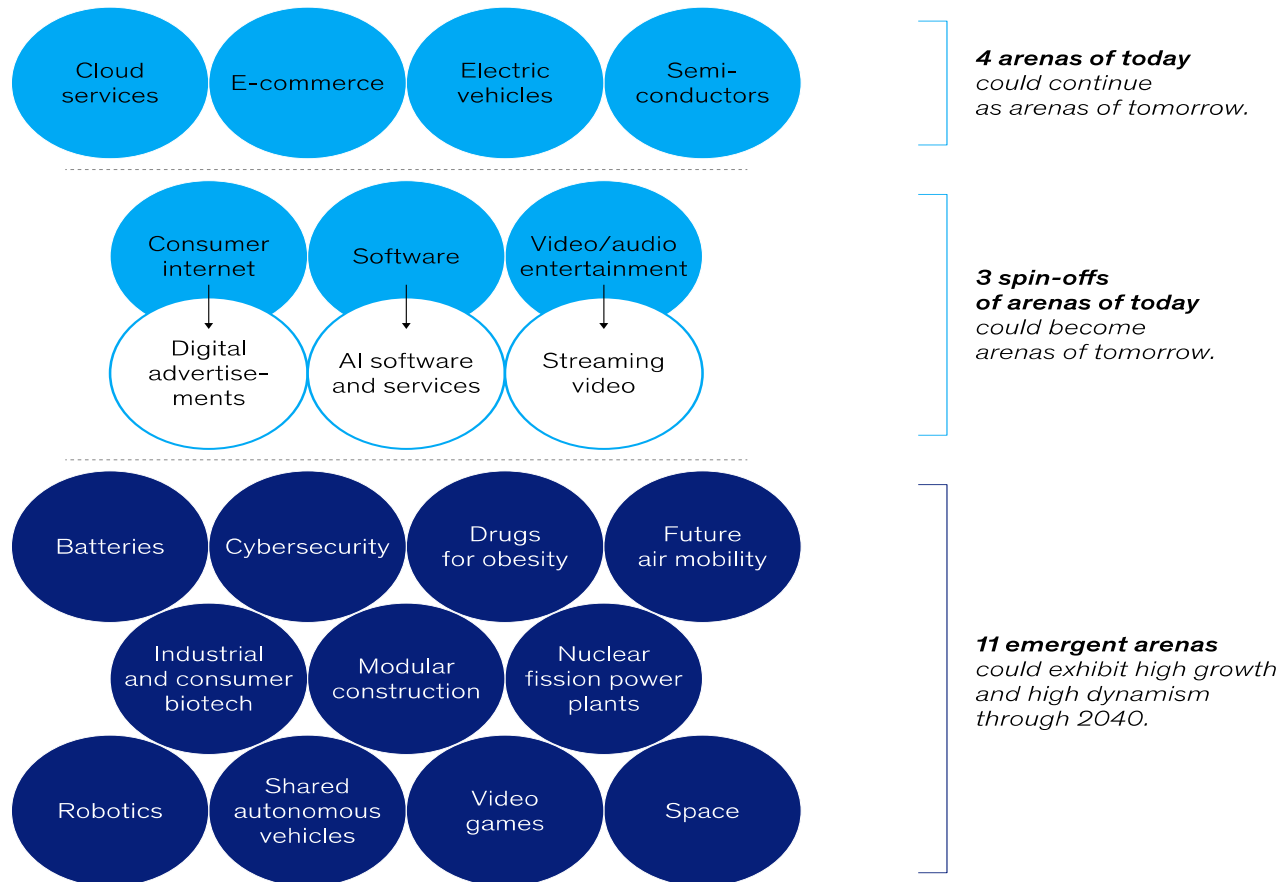
Source: S&P Capital IQ

Wizards out-magic the muggles?

The 18 potential arenas of tomorrow include arenas of today, spin-off arenas, and emergent arenas.

How certain industries might emerge as arenas of tomorrow

● Arenas of today ○ Subsegments of arenas of today ● Candidate arenas of tomorrow



Impact of AI innovation in the music industry

- Evolving NEW BUSINESS MODEL around
 - Streaming, subscription, product innovation, customer access/engagement, **diversification of revenue streams** through AI
 - **Exploring new genres and markets** through AI innovation
- Need to PROTECT ARTISTS' RIGHTS and **respect IP in the AI era**
 - Songwriting, composition, music sounds, artists' songs being performed in their own voice in different languages
 - Ethical approach and **transparency on AI model training** – voice cloning, impact of social media, royalty licence disputes
 - Established players (Sony, Warner, Universal) using „carrots and sticks“ on **AI to explore “new creative and commercial interests“** (Universal Music Group)

Embracing Responsible AI to Advance Innovation

- Enhancing artists' ability to experiment and boost creativity
- Defending artistry and right to fair compensation
- Adapting music to new products and formats

Health and wellness soundscapes



Endel

Social music creation



Gen AI content, attribution and compensation solutions

ProRata.ai



Voice-to-voice, voice-to-instrument AI



soundlabs.ai

Principles for Music Creation With AI

Roland

AI music incubator



YouTube

List of Literature

- *Artificial Intelligence Index Report 2024*, Stanford University Human-Centered Artificial Intelligence
- Clemens Fuest et al., *EU Innovation Policy. How to Escape the Middle Technology Trap*, European Policy Analysis Report, 2024
- Yan Coatanlem and Oliver Cost, *Cost of Failure and Competitiveness in Disruptive Innovation*, University of Bocconi, September 2024
- Chris Bradley et al., *The Next Big Arenas of Competition*, McKinsey Global Institute, October 2024
- Universal Music Group, Capital Markets Day 2024, 17 September 2024
- Jamie Smyth and Amanda Chu, “Nuclear energy stocks hit record highs on surging demand from AI”, Financial Times, 20 October 2024

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