The 4 horse riders of the Semiconductor Apocalypse

Sean Redmond, Managing Partner, Silicon Catalyst

A new AI driven world of Semiconductors

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- Where are we now?
- Where would industry like us to go?
- What do we need to do to get there?
- The role of startups and what we do in Silicon Catalyst to help them

There has never been a better time for Semiconductors

- 16 of the top 20 market caps in tech
- 3rd most profitable industry

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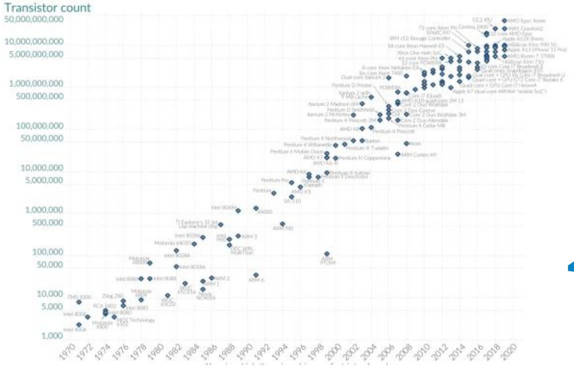
Transistors on a Chip



Source: Wikipedia

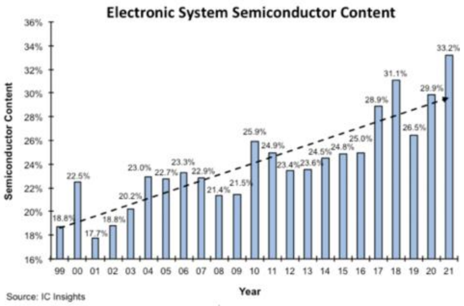
More R&D (innovation)

Lower cost/function

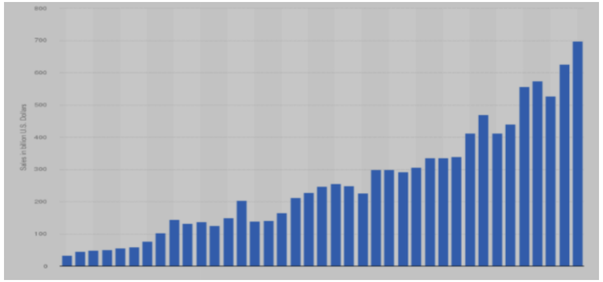
$’s

Expanding applications (more semiconductors)

Increasing semiconductor revenue

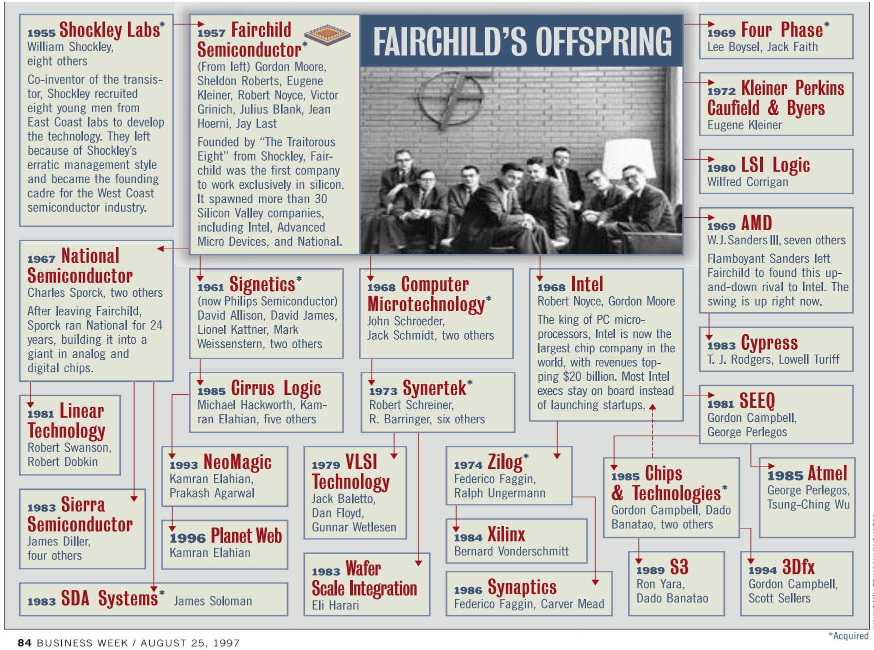


Semiconductor Revenue



Source: WSTS

News to chill the bones: Mature industry, high capital requirements, dwindling exits



Country Market share (IC Insights)

US 54%: intel, Qualcomm, Broadcom, Micron, Texas Instruments, NVIDIA, GlobalFoundries, Western Digital, ON, AMD

EU 6%: NXP, infineon, ST, arm

Taiwan 22%: tsmc, UMC, MEDIATEK

Japan 6%: SONY make.believe, RENESAS

Korea 9%: SAMSUNG, SK hynix

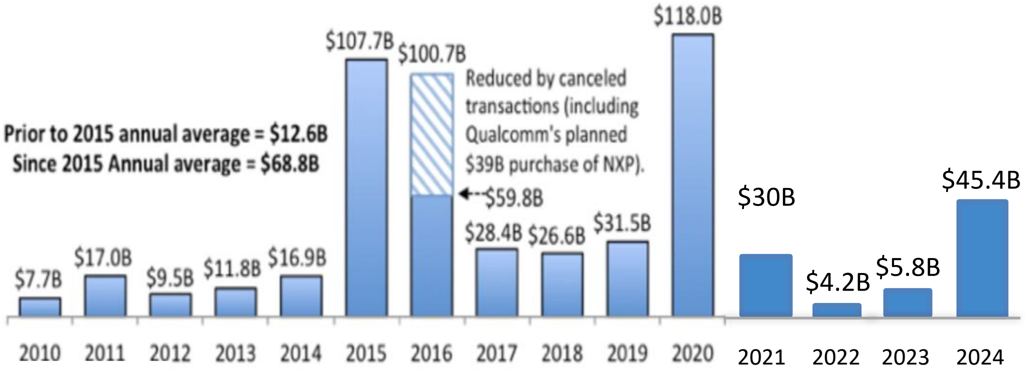
China 5%: SMIC, HISILICON, 长江存储 YANGTZE MEMORY

1960's

Mid 2020's

Huge waves of Consolidation => concentrated market

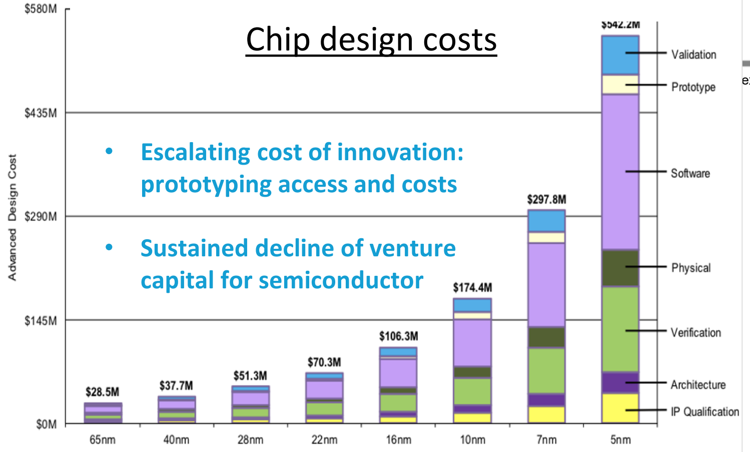
Semiconductor M&A Valuation



Source: IC Insights

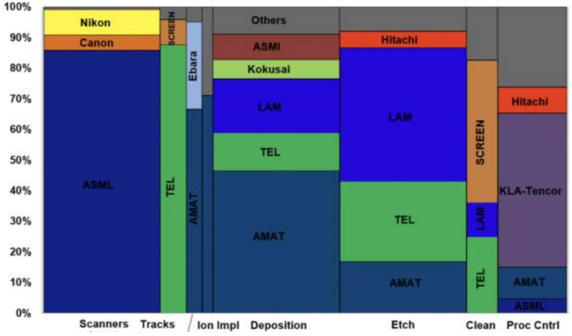
Chip design costs

- Escalating cost of innovation: prototyping access and costs
- Sustained decline of venture capital for semiconductor

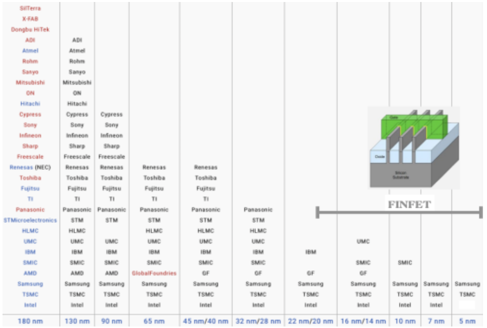


Source: M. Lapadeus, Semi Eng.

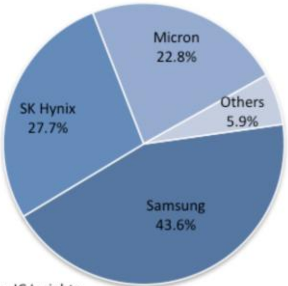
Equipment Market Share



Logic/Foundry platforms



DRAM Market Share



Source: IC Insights

The 4 horse riders of the apocalypse => scaling

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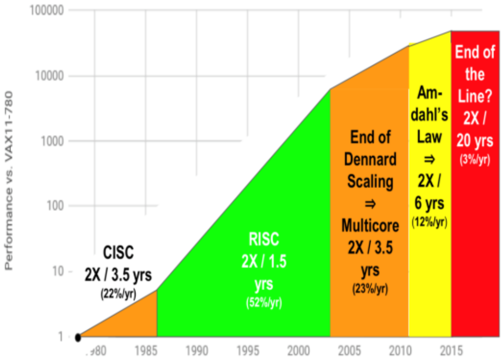
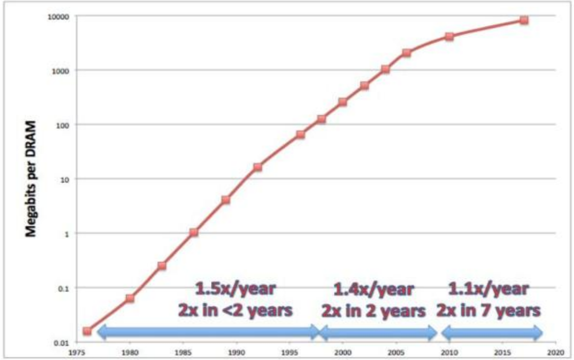
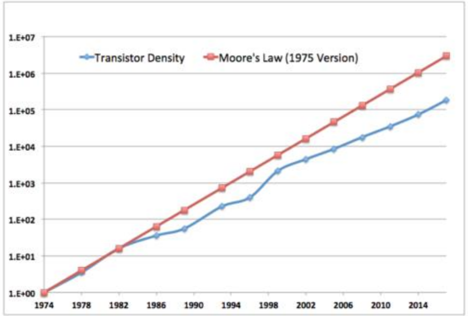
CPU single core performance



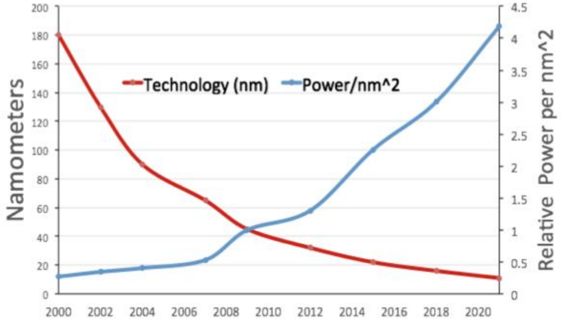
DRAM density roll off



Intel CPU density roll off



Transistor power takes off



Venture Capital investment in semiconductors

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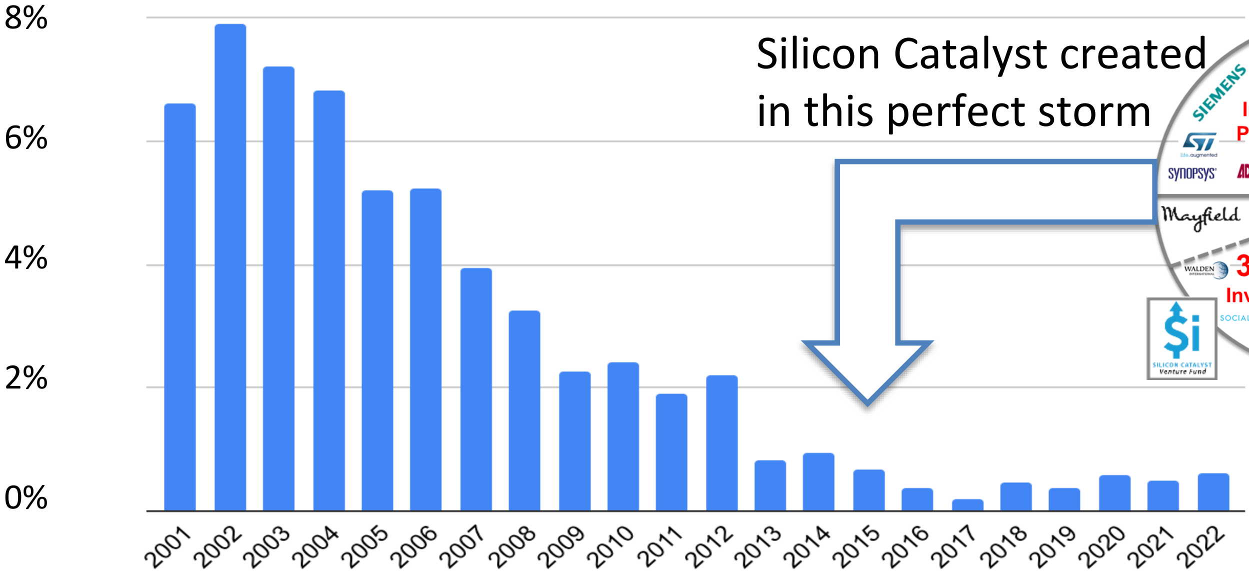
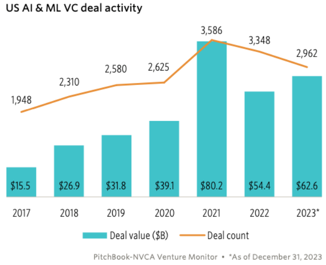
VC investment in semiconductor startups as % of total VC funding





System companies becoming silicon houses

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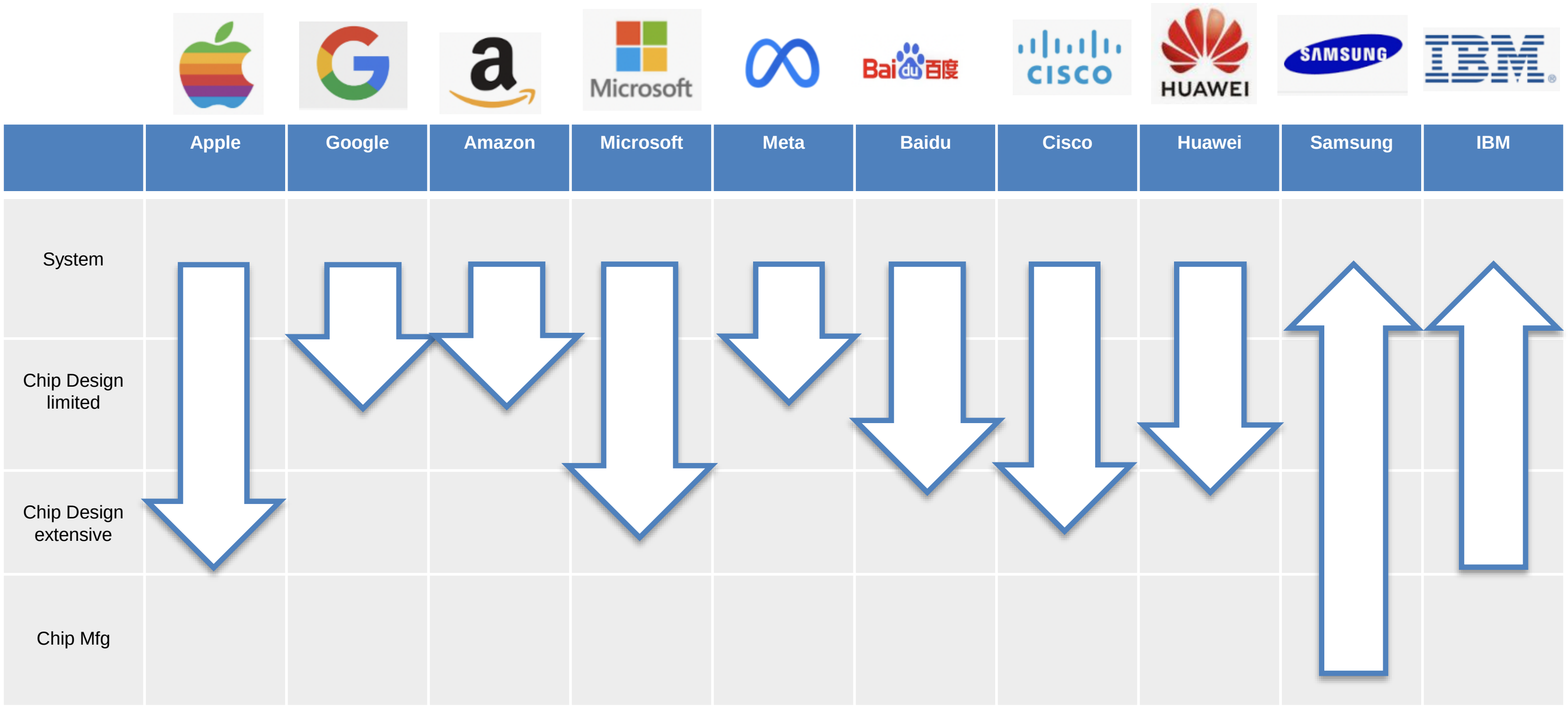

Source: VLSI Research (modified)

Where will it come from? new applications need 10^3 – 10^6 more performance

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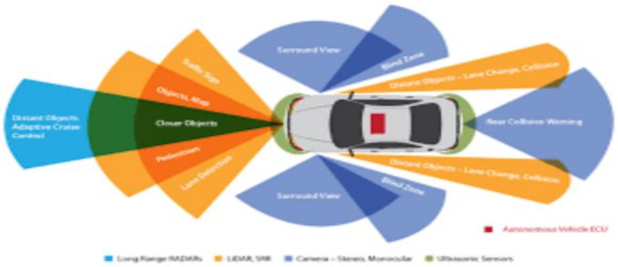
Virtual / Augmented Reality

A.I. Driven Everything

Remote Intelligence

Autonomous Everything



Are Semiconductor industry innovations are coming to the rescue?

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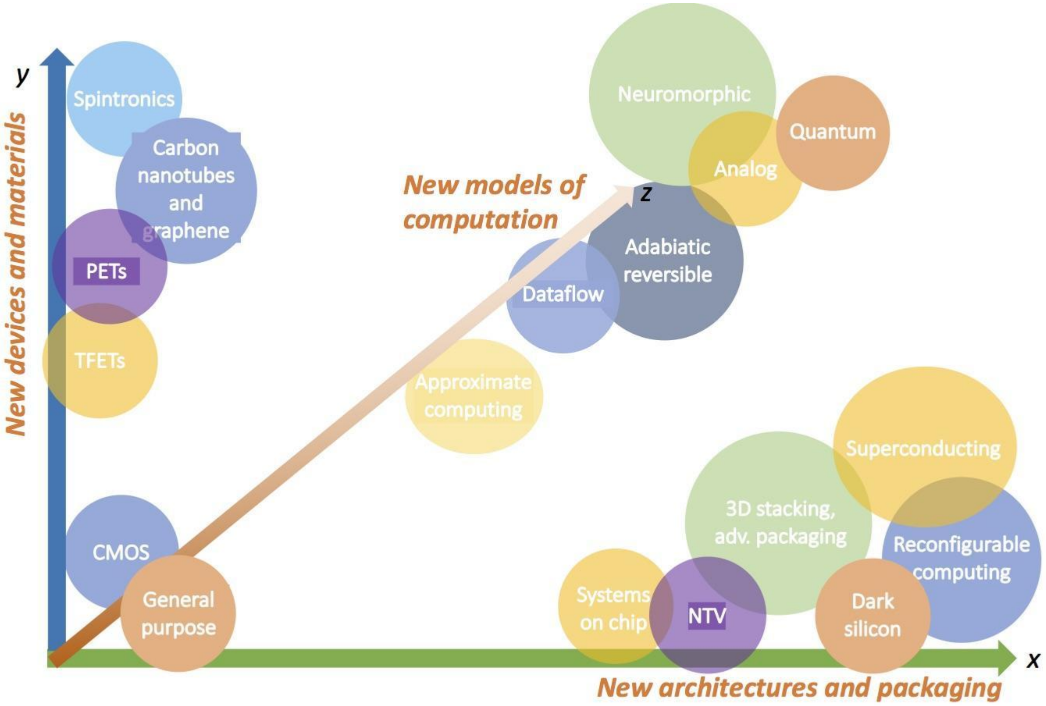
New Materials and Devices
20+ years (10 year lead time)



More Efficient Architectures and Packaging
The next 10 years

Downturn in Venture Capital startup funding from 2021 peak

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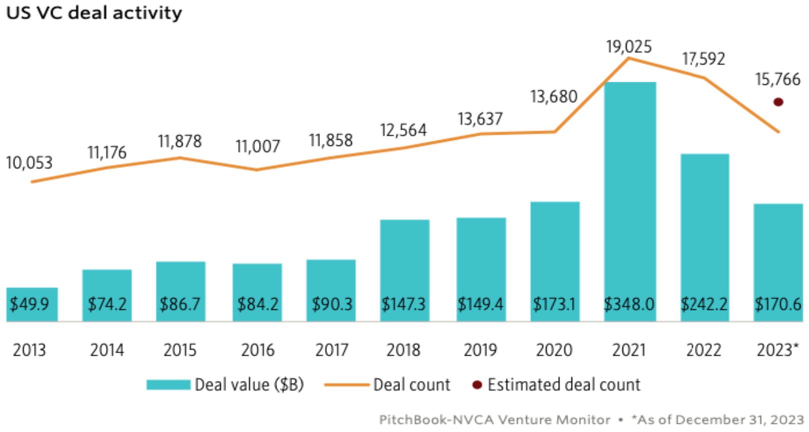
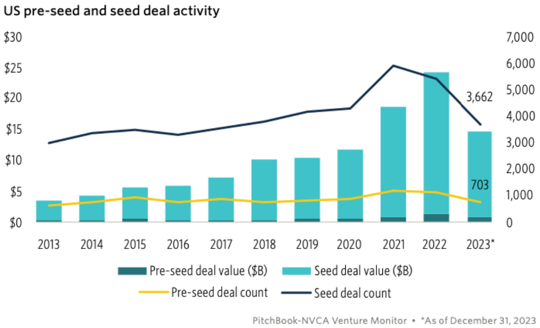
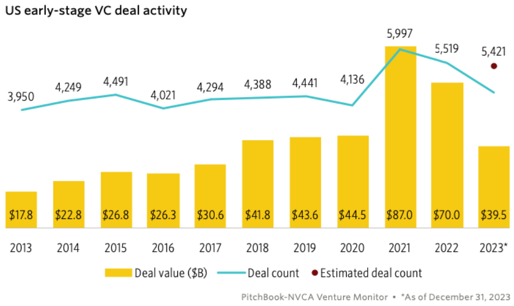
US VC investments – All stages



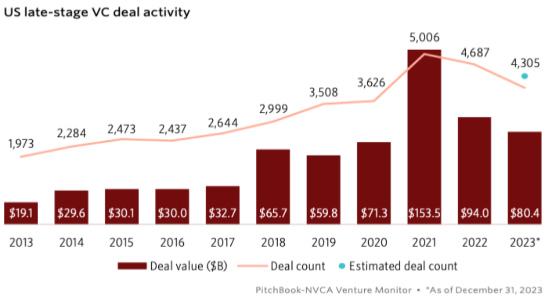
Pre-seed and Seed



Early Stage (Series A/B)



Late Stage (Series C/D)



Venture Capital chasing new AI Gold Rush

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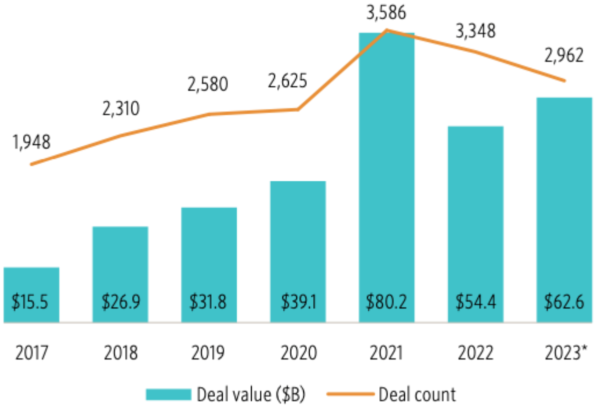
VC funding

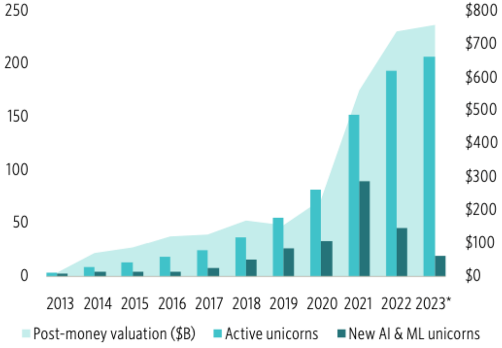
US AI & ML VC deal activity



PitchBook-NVCA Venture Monitor • *As of December 31, 2023

AI startup unicorn formation

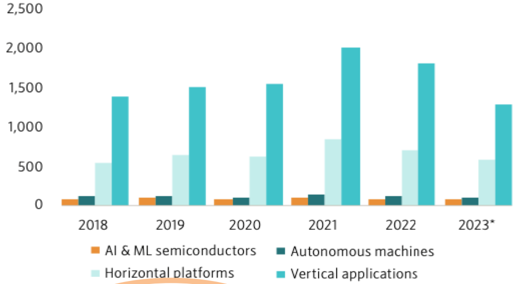
US AI & ML unicorn count and aggregate post-money valuation ($B)



PitchBook-NVCA Venture Monitor • *As of December 31, 2023

AI funding by sector

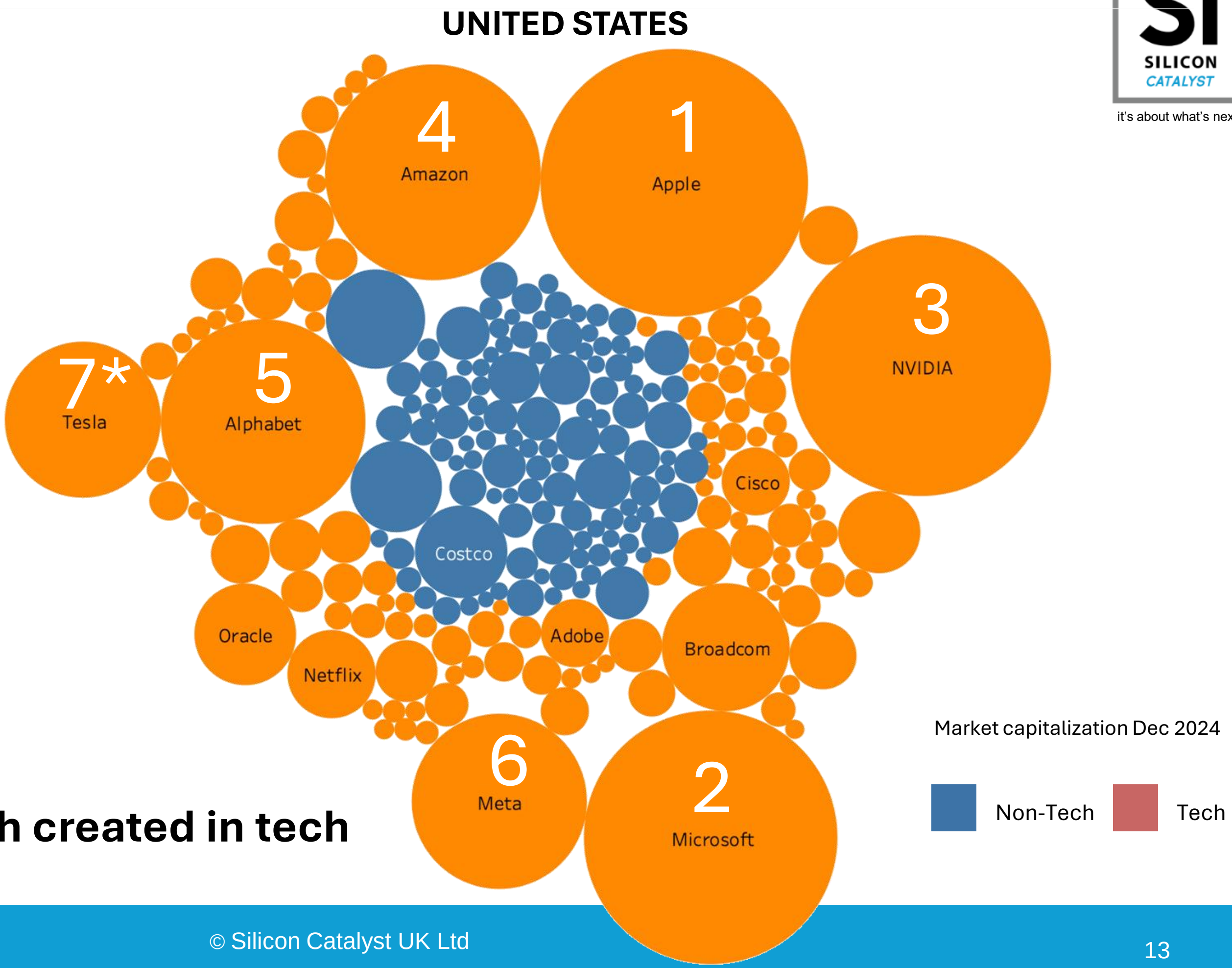
US AI & ML VC deal count by segment



PitchBook-NVCA Venture Monitor • *As of December 31, 2023

Ref: Stan Boland

The stakes are huge. In last 50 years, USA has built 118 tech companies from scratch worth >$10 billion



$20.5 trillion wealth created in tech

Ref: Stan Boland

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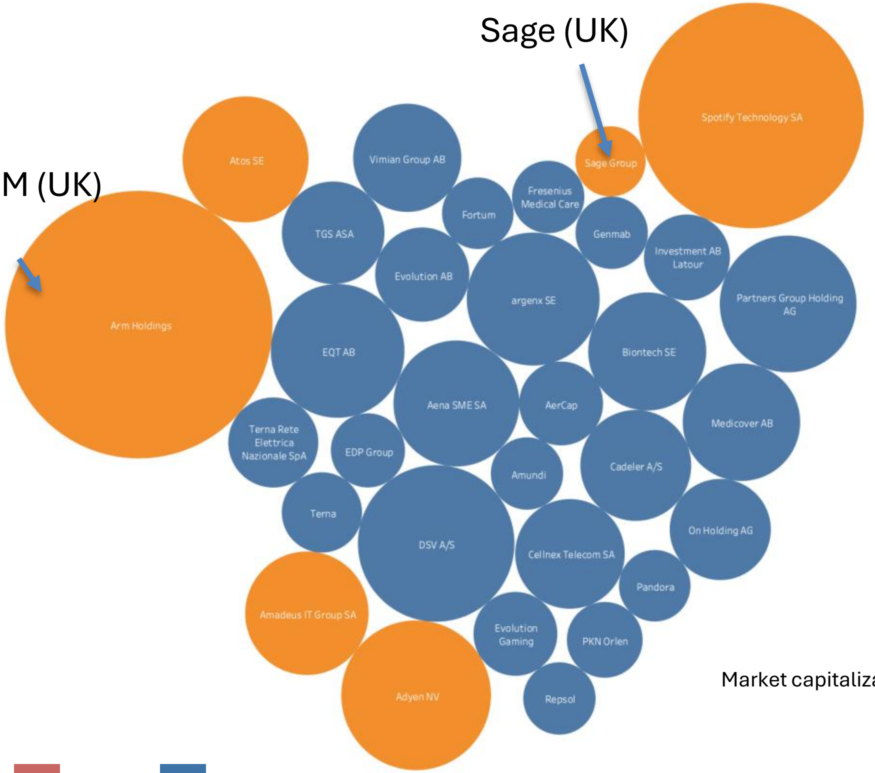
Whilst Europe has built just 6 tech companies worth >$10 billion from scratch
(2 are UK)

Europe

Sage (UK)

ARM (UK)

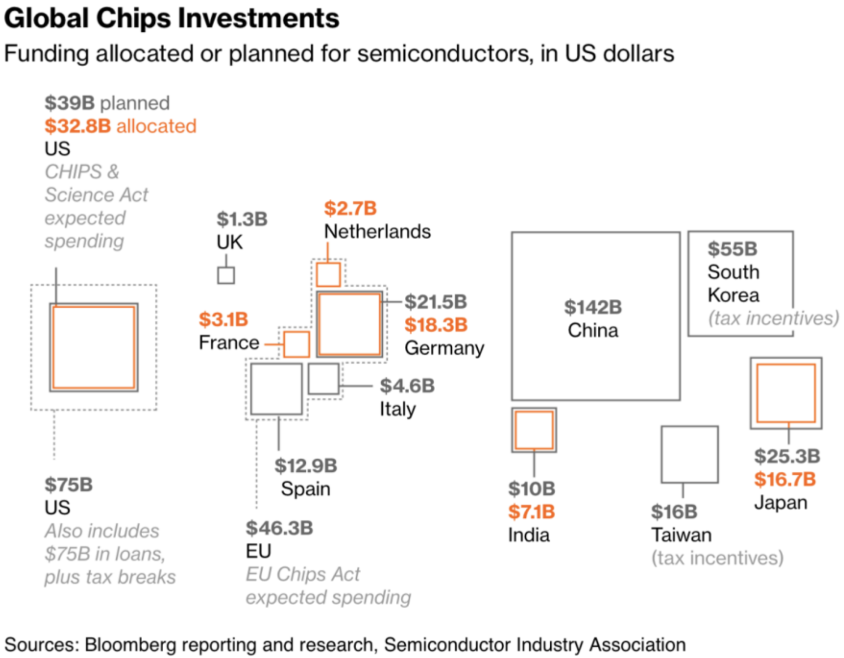


Market capitalization Dec 2024

Tech | Non-Tech

Only $374 billion wealth created in tech

Global investments in semiconductors



Silicon Catalyst: The World's #1 Semiconductor Accelerator

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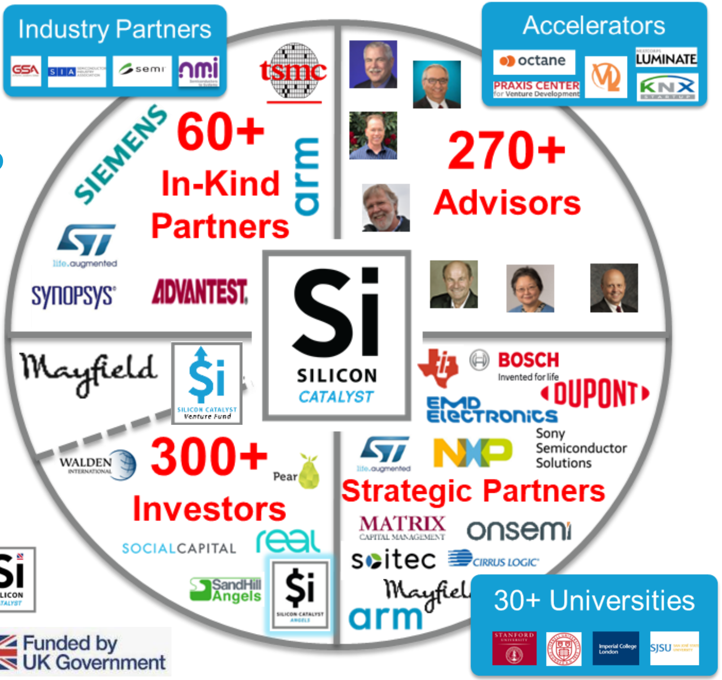
Over 120 startups – portfolio
>$1.9B valuation, >$500M raised

- A now proven ecosystem model for nurturing semiconductor start-ups
  - Training and advising
  - Providing access to EDA tools, Design IP & Foundry from In Kind Partners
  - Linking to the semiconductor ecosystem
  - Accessing and de-risking investment



- ChipStart UK Startup incubator
  - Fully funded by UK government
  - No cost access to early-stage startups

Department for Science, Innovation & Technology + SILICON CATALYST

Funded by UK Government

Good for Startups, Investors, Advisors… and the wider Economy