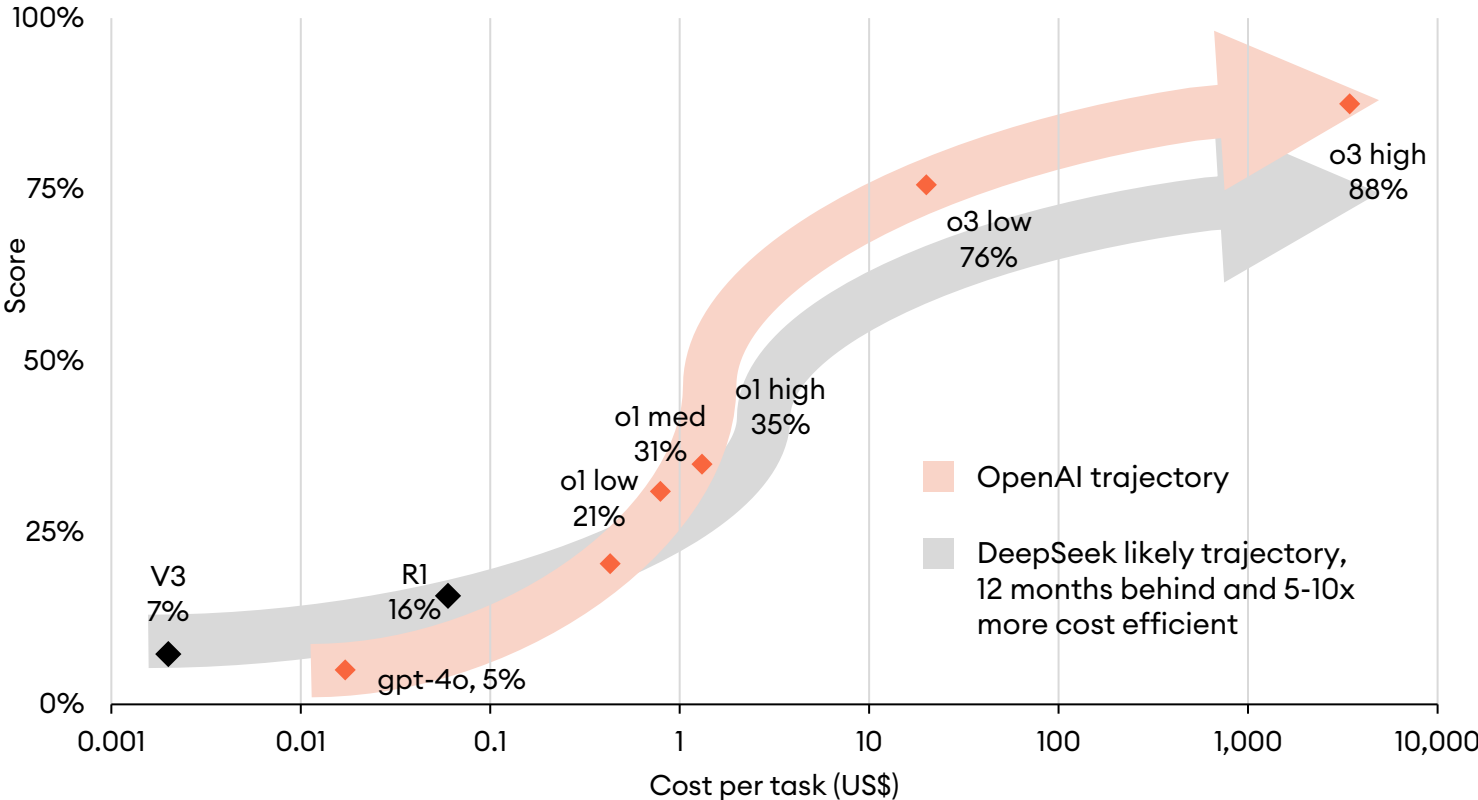


DeepSeek and you thought they don't need to scale compute? Look again

DeepSeek is off a strong baseline but needs to spend more on incremental compute to unlock emerging capabilities

ARC-AGI benchmarks score (%) vs. cost per task (US\$)



OpenAI's trajectory from gpt-4o to o3 high clearly shows how massively increasing compute per task (200,000x!!) drives breakthrough emerging capabilities.

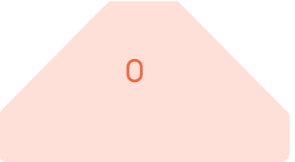
DeepSeek initial scoring at ARC AGI clearly shows the V3 model is about 10x more efficient than gpt-4o for a similar performance, if anything slightly better.

It also shows it is on a slower slope of improvement, as recurring learning and chain of thoughts are introduced, while throwing at the problem the same type of compute growth as OpenAI did between gpt4-o and o1.

This implies DeepSeek is likely to follow a similar compute growth trajectory as OpenAI to unlock emerging capabilities, although, because of the heavy optimization of the base model, potentially on a slower slope.

DeepSeek didn't break scaling laws and follows them already, like anyone else

Source: OpenAI and NSR estimates and analysis.



Relevant Further Research

- Microsoft 2FQ25: core Azure growth disappoints, AI momentum encouraging. Buy \$550TP – (30 January 2025) – [Link](#)
- DeepSeek: Is this the name of a wind in Chinese? – (27 January 2025) – [Link](#)
- Stargate: The cornelian dilemma of frontier AI economics in a single slide. – (24 January 2025) - [Link](#)
- Stargate: Big thinking on the future of AI Infrastructure. – (23 January 2025) - [Link](#)
- Memory in 2025: Can Chinese DRAM derail our thesis? – (17 January 2025) – [Link](#)
- TSMC to grow AI revenues 45% p.a. to 2029. Implications? – (21 January 2025) - [Link](#)
- TSMC 4Q24: buoyant outlook with room for upside. Top pick for 2025. Buy, NT\$ 1,450 TP – (17 January 2025) - [Link](#)
- Semi cycle update 4Q24: Recovery weaker but still on for 2025 – (16 January 2025) – [Link](#)
- Our top 4 picks for 2025 (+ 4 other ideas to consider)! - (8 January 2025) – [Link](#)
- OpenAI: o3 is a game changer - a few steps away from AG. After the \$1bn-to-train model, the \$1m-inference model. - (23 December 2024) – [Link](#)
- \$60-90bn Broadcom AI compute & networking SAM across 3 players? The underlying math. - (20 December 2024) – [Link](#)
- Memory in 2025: The fastest growing and most overlooked COGS of AI - (18 December 2024) – [Link](#)
- Broadcom 4FQ24: Begun, the ASIC Wars have. Buy, \$245 TP - (13 December 2024) – [Link](#)
- Bible 3Q24 – Hyperscale & Cloud: AI spending spree, CPU servers about to recover? - (5 December 2024) – [Link](#)
- The \$300bn question: Can expectations for Hyperscaler capex in 2025 increase another 15-25%? - (31 October 2024) – [Link](#)
- Hot Chips: The sky is the limit – reasons to remain bullish about AI infrastructure demand. - (4 September 2024) – [Link](#)
- Gen AI: Who is spending what? Where will revenues come from? The ultimate industry model. - (9 August 2024) – [Link](#)
- What makes a good AI chip? Our answer, in a single slide. - (7 August 2024) – [Link](#)
- What does TPUv5 tell us about competitive dynamics between ASICs and GPUs? – (22 April 2024) – [Link](#)
- Nvidia, Broadcom, and the future of AI: Deeper thoughts on the back of last week's events – (25 March 2024) – [Link](#)
- \$400bn spent on datacenter AI chips in 2027? Part II: Implications for infrastructure providers. – (24 January 2024) – [Link](#)
- \$400bn spent on datacenter AI chips in 2027? Part I: Is it possible? The mother-of-all sanity checks – (4 January 2024) – [Link](#)
- What drives Hyperscale capex going forward? A deep dive in the economics of Cloud – (27 March 2023) – [Link](#)

Disclosures

12 month historical recommendation changes are available on request

This report was produced by New Street Research LLP. 100 Bishopsgate, 18th Floor, London EC2M 1GT Tel: +44 20 7375 9111

Regulatory Disclosures: This research is directed only at persons classified as Professional Clients under the rules of the Financial Conduct Authority ('FCA'), and must not be re-distributed to Retail Clients as defined in the rules of the FCA.

This research is for our clients only. It is based on current public information which we consider reliable, but we do not represent that it is accurate or complete, and it should not be relied on as such. We seek to update our research as appropriate, but various regulations may prevent us from doing so. Most of our reports are published at irregular intervals as appropriate in the analyst's judgment.

This research is not an offer to sell or the solicitation of an offer to buy any security in any jurisdiction where such an offer or solicitation would be illegal. It does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual clients.

All our research reports are disseminated and available to all clients simultaneously through electronic publication to our website.

© Copyright 2025 New Street Research LLP

No part of this material may be copied, photocopied or duplicated in any form by any means or redistributed without the prior written consent of New Street Research LLP.

New Street Research LLC is neither a registered investment advisor nor a broker/dealer. Subscribers and/or readers are advised that the information contained in this report is not to be construed or relied upon as investment, tax planning, accounting and/or legal advice, nor is it to be construed in any way as a recommendation to buy or sell any security or any other form of investment. All opinions, analyses and information contained herein is based upon sources believed to be reliable and is written in good faith, but no representation or warranty of any kind, express or implied, is made herein concerning any investment, tax, accounting and/or legal matter or the accuracy, completeness, correctness, timeliness and/or appropriateness of any of the information contained herein. Subscribers and/or readers are further advised that the Company does not necessarily update the information and/or opinions set forth in this and/or any subsequent version of this report. Readers are urged to consult with their own independent professional advisors with respect to any matter herein. All information contained herein and/or this website should be independently verified.

All research is issued under the regulatory oversight of New Street Research LLP.