

Weekend Essay

The AI Boom Needs a Market for Compute

Just as oil futures and spectrum auctions unlocked waves of investment, turning compute into a tradable commodity will be needed to fuel AI's next stage.

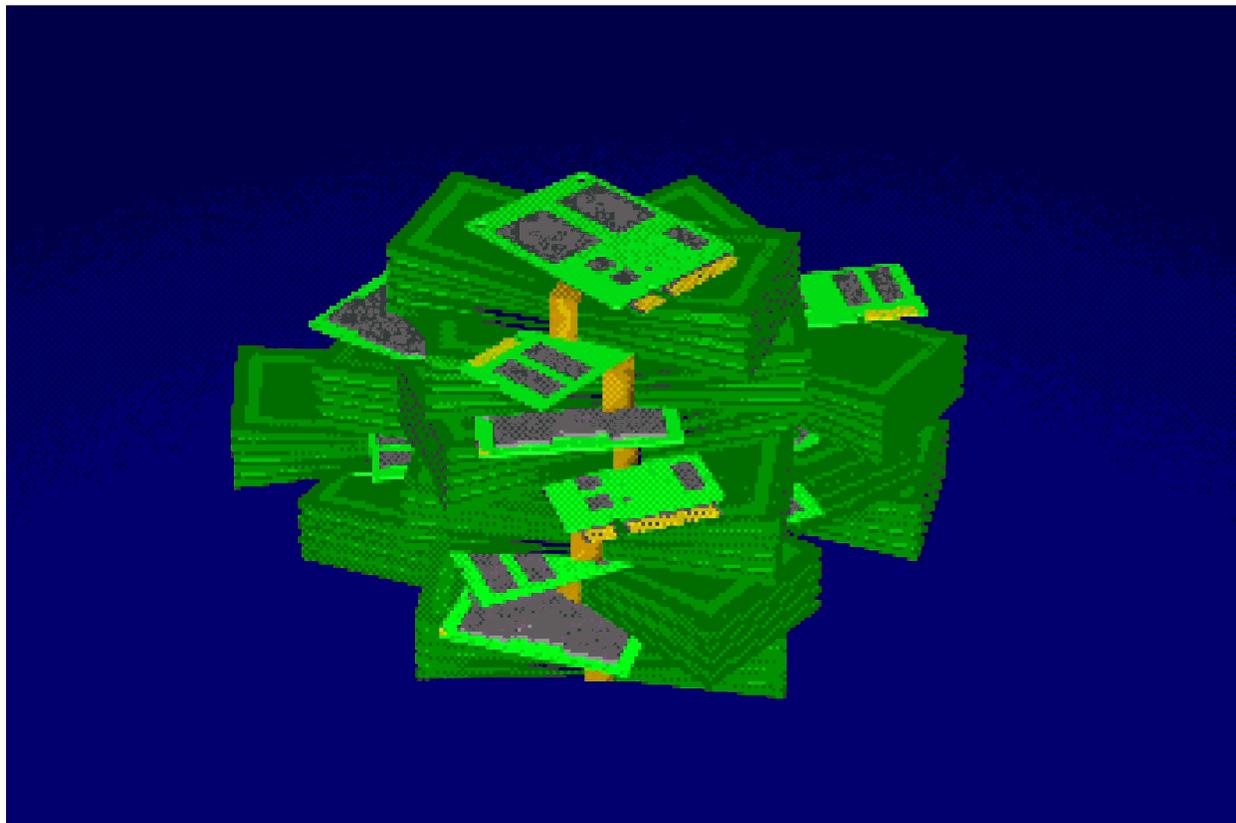
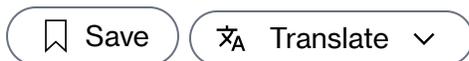


Illustration: Erik Carter for Bloomberg

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The AI Boom Needs a Market for Compute (Audio)

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There's money – really big money – in selling compute, the processing power driving the AI revolution.

Hyperscaler CoreWeave Inc. is worth more than \$50 billion even as its losses are projected to increase tenfold this year, to \$650 million. Oracle Corp., meanwhile, recently added some \$250 billion to its market capitalization overnight after revealing the size of its upcoming order book. What's unclear is whether those valuations are based on a scarcity thesis – that demand is likely to outstrip supply for years to come – or an abundance thesis, foreseeing a multitrillion-dollar market where these companies will be among the many winners.

In a world where the promise of AI is fulfilled and today's valuations for companies like OpenAI are justified, compute providers will be more akin to Walmart, with its high-volume, low-margin stores, than a high-margin, medium-volume business like LVMH. That world aligns roughly with McKinsey & Co.'s bull-case scenario of \$7.9 trillion in data center investment over the next five years, and would also be good news for the industry: Walmart Inc. after all, is a lot more profitable than LVMH Moët Hennessy Louis Vuitton SE.

Even McKinsey's bear case of \$3.7 trillion, however, implies a magnitude of capital flows with little precedent in human history. And if that's going to happen, one necessary precondition is that compute needs to be priced a lot more transparently.

In the clunky current system, the chief operating officer of an AI company calls up Amazon Web Services Inc. or CoreWeave and asks for a price. That's a major bottleneck, since it's difficult for consumers of compute to shop around, especially if there are many different configurations they'd be happy with at the right price. And while vendors enjoy the extra pricing power the status quo gives them, they'd also love to be able to compete effortlessly on every contract being negotiated anywhere in the world. That means sooner or later we're going to have to have a public market for compute, much as we do for all other valuable commodities.

The good news is that transitioning to a market-based system has happened many times before, generally with great success. The oil and gas industry, for instance, struggled with significant capital constraints when it came to exploration up until around 1983, when the introduction of crude oil futures brought a lot more liquidity into the market. Something similar happened in the 1990s, when chunks of the electromagnetic spectrum previously allocated by governments started being auctioned, priced and invested in.

The godfather of spectrum auctions is Paul Milgrom, the Stanford economist who won the Nobel Prize in 2020 for his work on auction design. Now, Milgrom and his company, Auctionomics Inc., have teamed up with OneChronos Markets, a company that builds smart exchanges, to do for compute what Milgrom did for spectrum.

With AI technology, that's now possible. As a rule, the simpler and more fungible the commodity, the easier it is to trade. Grain futures date back almost 4,000 years, to the Mesopotamian Code of Hammurabi; oil futures, by contrast, required the creation of standards like Brent Crude and West Texas Intermediate. Compute markets – both spot and futures – involve so many variables that they've become a possibility only with the advent of AI agents that can accept natural-language inputs. Those agents then turn high-level English-language goals and instructions into detailed structured “expressive bidding” that can be executed on-exchange.



Paul Milgrom at the 2022 Nobel Prize award ceremony. *Photographer: Jonathan Nackstrand/AFP/Getty Images*

The trick is to use what's known as combinatorial auctions. Bidders might care very much about having an uninterrupted stretch of time to do their computations, for instance, or they might be willing to break it up if someone else wanted the data center urgently and briefly. Similarly, a bidder might ideally want to use B200 chips, but would be fine with paying slightly less money to use more H100 chips for more hours. Right now the market in compute is almost entirely bespoke: A client explains what they're looking for, and a vendor gives them a price. But with combinatorial auctions, a large number of buyers and sellers can collectively arrive at prices for the optimal allocation of every chip during every hour of every day.

That in turn maximizes value, not least because it significantly reduces the risk associated with buying compute. "One of the things that can really hurt the value of an asset is liquidity risk, or the inability to resell it," says OneChronos co-founder and Chief Executive Officer Kelly Littlepage. Once compute spot markets are in place, every buyer will become a potential reseller of the commodity, creating vastly more potential vendors from whom chip time can be bought.

As Auctionomics co-founder Silvia Console Battilana puts it: “Making compute liquid and adding futures markets will expand investment, increase competition and rationalize AI demand.” Indeed, it’s hard to see how trillions of dollars of investment could possibly be sourced absent the existence of some kind of market-based hedging mechanism. The risks would otherwise be too large for investors to bear, especially given the counterparty risk involved in selling future compute to AI companies that are losing billions of dollars a month.

“A traditional market can’t handle these types of counterparty constraints,” explains Littlepage. “You need a combinatorial auction to do that.”

The potential size of this new market is almost limitless. “Since the first US spectrum auctions in 1994, the total value of spectrum sales worldwide has been hundreds of billions of dollars,” notes Console Battilana – nearly all of which has been spent just once. The primary market for compute alone will reach into the trillions of dollars; once it becomes actively traded, total on-market volume could reach in excess of tens of trillions of dollars.



Weekend



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It’s more than fine for a slew of hedge funds and other financial institutions to start speculating in the market without actually wanting to use the product being traded: Their involvement will be crucial to spreading risks and providing liquidity. In turn, much bigger projects will become feasible, not to mention use cases that are just as unforeseeable now as the internet of things was when spectrum auctions got started in 1994.

A market in compute will also allow data centers to get bigger faster. At the moment, data center operators are promising 99.999% uptime to their clients and building new facilities on the same basis. That means data centers contribute directly to peak power demand, which in turn stretches

out the approval process and worries utilities. If, however, the operator promises utilities that it will be able to “flex down” when demand is highest or when a key source of supply goes offline, that could make it much easier to build significantly bigger operations. The operators will then be selling 99% reliable uptime, or maybe 98%, and will probably also have more capacity than promised in any given year, which they’ll need to sell at the last minute. Those are the kind of things that liquid markets are great at finding demand for.

That’s the abundance vision for compute, one where the sheer scale of the market allows for greater profits even if on-exchange trading compresses margins. That said, it’s just as possible that a transparent market in compute will accelerate demand faster than it does supply, sending margins up rather than down.

We should begin to find out which future we’re entering pretty soon. OneChronos and Auctionomics are being coy about when exactly this market will be unveiled, but they’re hinting that it’s imminent. Once that happens, a necessary precondition for the AI revolution will finally be in place.



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