Math and Finance: How AI Could Create a Problem Beyond Hallucinations

Everyone talks about AI hallucinations. A chatbot invents a court case. A summary fabricates a statistic. These are visible failures, easy to spot, easy to ridicule.

But there is a far more dangerous problem hiding in plain sight. One that sits at the intersection of mathematics, finance, and artificial intelligence. One where the numbers do not add up, and nobody seems to care.

The Hallucination We Should Actually Fear

When we discuss AI risk, we default to the obvious: models generating false information. I have talked about this subject in past posts. That is a known problem with known mitigations. Guardrails, human-in-the-loop, deterministic workflows.

The real threat is not that AI produces wrong answers. It is that AI enables an entire financial ecosystem to avoid asking the right questions.

OpenAI has committed to $1.15 trillion in infrastructure deals. Its projected revenue for 2025 is $20 billion. It is currently losing $10 billion per year. To meet its obligations, it needs to grow revenue 85 times in five years and become the largest company in human history.

A first-year accounting student could see the gap. Yet the money keeps flowing.

Circular Logic at Industrial Scale

The financial architecture around AI is not a bubble. As Kenny Vaneetvelde argues in his article Why the AI Bubble Is Even Worse than We Thought, it is a black hole, one that pulls capital in with no mechanism to release it.

The circular dealing is breathtaking. Microsoft invests in OpenAI as Azure credits. OpenAI spends those credits on Azure. Microsoft uses that "revenue" to buy Nvidia chips. Nvidia invests $100 billion back into OpenAI. OpenAI commits to buying more Nvidia chips. The loop continues.

Michael Burry, who predicted the 2008 crash, is now betting against Nvidia. His assessment: "True end demand is ridiculously small. Almost all customers are funded by their dealers."

Meanwhile, big tech has collectively added $10 billion to profits over two years simply by declaring that servers now last six years instead of four. No operational change. Just an accounting adjustment.

The Indeterministic Problem Nobody Discusses

Here is where it gets truly dangerous for finance.

Pure AI systems are fundamentally indeterministic. The same input can produce different outputs on different runs. This is a feature for creative applications. It is a catastrophic liability for financial ones.

Traditional software in banking follows deterministic paths. Input A always produces Output B. Auditable. Compliant. Predictable. AI breaks this contract.

When AI models drive credit decisions, ESG scoring, risk assessment, or algorithmic trading, their probabilistic nature introduces variability that existing regulatory frameworks were never designed to handle. Algorithmic trading already amplifies short-term trends, creating feedback loops. Add non-deterministic AI to that equation and you get volatility that is not just unpredictable, it is inexplicable.

The EU AI Act recognises this. Gartner and Forrester flag it. Yet adoption races ahead of governance.

The Math That Should Alarm Everyone

The AI infrastructure wave requires roughly USD 1–3 trillion of annual CAPEX and OPEX by 2030 to justify the investment.

Key data points:

- Global data centre CAPEX (all types, not just AI) was about USD 455 billion in 2024 and is projected to grow more than 30% in 2025, with AI training infrastructure growing 161% year-on-year.
- AI-driven data centre equipment and infrastructure spend (servers, power, cooling, etc.) was about USD 290 billion in 2024 and is forecast to head toward USD 1 trillion annually by 2030, driven largely by AI workloads.
- Broader AI spending (including infra, software, services) is projected at roughly USD 2.5 trillion in 2026, of which about USD 1.37 trillion is explicitly infrastructure.
- That figure exceeds the combined 2024 revenue of Amazon, Apple, Alphabet, Microsoft, Meta, and Nvidia. It represents 7% of US GDP.

According to MIT, 95% of organisations investing in generative AI are getting zero return. Just 3% of people pay for AI services.

The share of the economy devoted to AI investment is already a third greater than the share devoted to internet investment during the dot-com bubble. We are spending more, relative to GDP, than during one of history's most famous manias.

And the financing mechanisms look disturbingly familiar. GPU-backed loans use chips as collateral, chips that depreciate the moment a new model releases. Special-purpose vehicles keep debt off balance sheets, exactly the structure Enron used before its collapse and banks used before 2008. Data-centre debt is being sliced into asset-backed securities and sold to investors who do not understand what is inside.

As Mark Zandi, chief economist at Moody's Analytics, put it: "A few months ago I would have told you that this was building toward a repeat of the dot-com crash. But all this debt and financial engineering is making me increasingly worried about a 2008-like scenario."

The End of Multi-Billion Dollar Tech Companies

Joe Procopio makes a compelling case that this structural instability signals something larger. The broader the target market, the more technology fails that market. Multi-billion-dollar software companies survive on massive, homogenised customer cohorts. AI is exposing that this model was always fragile.

The real disruption is not AI replacing developers. It is AI enabling continuous intelligence, real-time understanding of what to build and who to build it for, at near-zero incremental cost. When anyone can do what a multi-billion-dollar company does, but better and cheaper, the economic logic for those companies collapses.

Software ate the world. Now AI is eating software. The stocks of SaaS companies have seen their worst performance relative to the S&P 500 on record. Business development companies hold 25% of their loan exposure in technology. When software valuations correct, the impact ripples through private credit, pension funds, and insurance companies.

What Actually Needs to Happen

The problem beyond hallucinations is not technical. It is structural.

For investors: Question the circular revenue. If Company A's revenue is Company B's investment, which is Company C's purchase order, which flows back to Company A, that is not a market. It is a merry-go-round.

For regulators: AI governance in finance cannot wait. Deterministic AI for compliance-critical functions. Mandatory disclosure of AI decision-making processes. Proper stress-testing of GPU-backed lending.

For leaders: Stop treating AI adoption as inevitable and start treating it as a strategic decision with measurable ROI. The 95% failure rate is not a technology problem. It is a discipline problem.

For the rest of us: Pay attention to the maths. Not the marketing. When a company needs to become the largest in human history just to pay its bills, that is not ambition. That is denial.

The "AI revolution" may be real. The technology certainly is. But the financial structure being built around it is a house of cards dressed up in quarterly earnings reports and trillion-dollar press releases.

Hallucinations are fixable. Trillions in circular debt backed by depreciating assets and financed through structures we last saw in 2007? That is a different problem entirely.

Something has to give.

What do you think, is the AI financial structure sustainable, or are we watching the next crisis form in real time?

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