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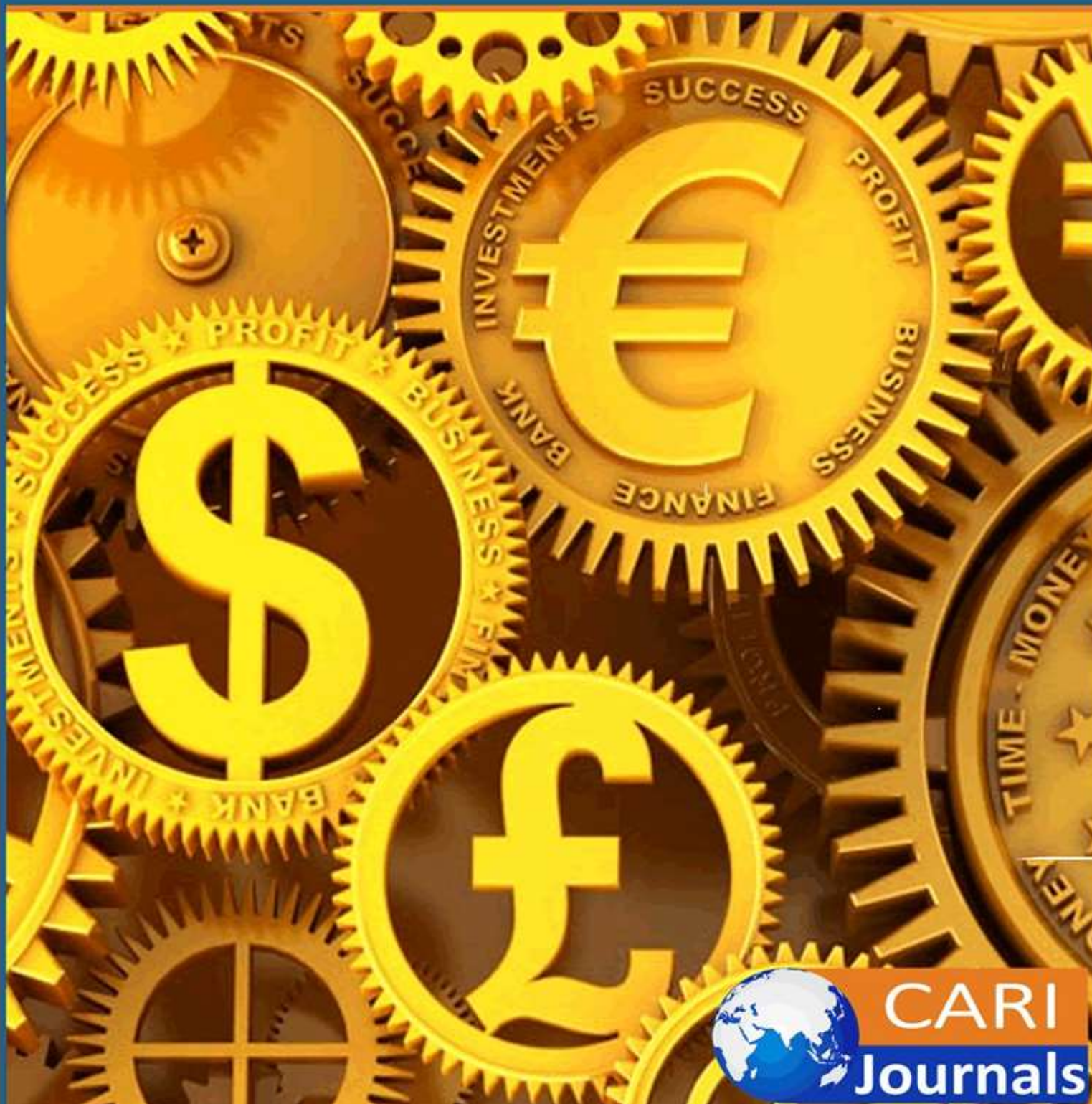

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Introduction: Capital Deployment in Artificial Intelligence

Prateek Upreti

University of Arkansas at Little Rock

https://orcid.org/0009-0004-9214-3224

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Abstract

The purpose of this study is to evaluate the recent capital deployment in artificial intelligence and the risk it entails to the global economy. The paper began with the recent interest in Artificial Intelligence from investors which has led to massive deployment of capital in the sector. It focuses on the investment gap and the possibility that it has developed a financial bubble and further discusses the mechanics of formation of a bubble. The paper also highlights the energy requirement, and infrastructure needs to support the recent development. Finally, paper discusses the role of sovereign investment and geopolitical aspect of AI and how to mitigate against those emerging risks. The paper concludes with risk management and precautions that can lead to successful AI deployment without risking economic growth around the globe.

Keywords: *Artificial Intelligence, Capital Deployment, Economic Risk*

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Introduction

Over the decades there have been many time periods when there has been massive capital deployment in developing technologies. From internet to semiconductors, all technologies that are now essential were once funded by capital deployment from government and private companies. Capital deployment refers to investment in emerging technologies to support their requirement for infrastructure and other business development needs.

The global economy is now dominated by one technological pivot: the massive integration of artificial intelligence fueled by debt. It is estimates that artificial intelligence could contribute $20 to $25 trillion to the global economy by 2023 (McKinsey, 2023). In addition to software sales, this figure also represents a surge in total-factor productivity (TFP) in which AI will automate up to 70% of tasks currently carried out by humans. In spite of capital flowing into hyperscalers and speculative startups at record rates, a disconnect has emerged. Capital is being front-loaded at an extraordinary rate in Artificial intelligence: for example, the U.S. tech giants investing more than triple their annual equity investment from $150 billion in 2023 to $500 billion in 2026 (J.P. Morgan, 2022). In this paper, we argue that the current trajectory of AI funding poses significant systemic risks, including unsustainable valuations, a fragile reliance on a small number of technology giants, and an emerging "liquidity trap" in which AI infrastructure costs outpaces its revenue. We will further discuss the mitigation of those risk and the pathway to successful deployment of this emerging technology.

1. The Scale of AI Financial Projections

The current financial models for AI depend on extraordinary growth expectations. In 2025, many AI companies saw their market capitalizations exceeded the GDP of many developed nations, with many companies exceeding the trillion dollar mark (Storm, 2025). There has been a massive expansion in the Total Addressable Market (TAM) for compute, which contributes to this valuation surge. As of 2025, the global AI hardware industry will sell over $400 billion in hardware, which represents a 60% increase from the previous year (GrandViewResearch, 2025). Based on forecasts, this build-out is likely to contribute $15 to $25 trillion to global GDP by 2030 (McKinsey, 2023). Nevertheless, this projection assumes a seamless transition from hardware installation to Total-Factor Productivity (TFP) gains - which can take decades. At the end of 2025, the market has already priced in this productivity miracle, creating a value front loading that leaves no room for delays or regulatory friction.

It is generally believed that AI is a "General Purpose Technology" (GPT) similar to electricity or the internal combustion engine. However, unlike previous software cycles (SaaS and Cloud), AI cycles need massive upfront hardware investment before running a single line of inference code. The market performance is now hyper-concentrated, with few firms representing over majority of the total market value. Any downward revision in AI revenue projections will trigger a massive,

synchronized market correction. With 2026 expected to host trillion-dollar IPOs for companies heavily involved, the market's ability to absorb such massive valuations—amidst high interest rates—is being tested to its limit. For the broader economy, a failed AI thesis would lead to trillions of dollars locked in $20 billion data centers and specialized chips would become non-performing assets, potentially freezing credit markets as lenders reassess the solvency of highly leveraged tech and utility firms. This would spike the "cost of capital" across all industries, stalling non-AI innovation and potentially wiping out trillions in household wealth tied to tech-heavy pension funds and retirement accounts.

2. Capital Expenditure and the Investment Gap

Majority of organizations report regular use of AI in at least one operational function by late 2025, but only small portion of those companies report any measurable financial impact at operational level, and most report less than 5% (McKinsey, 2025). For the industries to generate just a modest return on this infrastructure, it would require over billions in revenue each year. There is a "liquidity trap" created by this disconnect in which the cost of building a data center, now over approximately $20 billion per facility, surpasses the actual revenue generated by the software layers. Hence as a result, a maturity lag has been resulted from this as most organizations are still in the testing and piloting stages. Over 60% of companies are experimenting with "AI agents," but scaling these into revenue-generating products has proven slower than the hardware build-out suggested. In addition, many companies have committed over $300 billion to data center projects, however many companies are not expected to become profitable until the end of the decade (Financial Content).

This widening infrastructure-revenue chasm is creating a valuation overhang that threatens broader market stability. As capital remains locked in $20 billion data centers with the velocity of innovation in the software layer is struggling to keep pace. This mismatch forces a crowding out effect, where essential enterprise R&D and dividend growth are cannibalized to service the massive debt loads required for sheer computing power.

For global markets, the danger is no longer just a classic bubble burst, but a prolonged period of AI stagnation. If the hundreds of billion revenue threshold isn't crossed by 2027, the resulting credit tightening could trigger a systemic deleveraging event. Investors are increasingly wary of "ghost compute," where massive clusters sit idle or under-monetized while carrying high interest costs. This creates a venerable for the tech sector: the point where the debt generated to fund the AI revolution can no longer be supported by the actual cash flows the technology produces. Consequently, it represents a shift from speculative optimism to a reality check that could redefine the cost of capital for the next decade.

3. The Mechanics of the "AI Bubble"

As the financial debt funding is expected to exceed a level historically associated with market corrections (Storm, 2025), now a potential concentration of AI funding poses systemic threats that go beyond individual company failures. The narrow leadership creates a single point of failure for retirement and institutional investments. (Investopedia, 2025). Consequently, this narrow concentration creates a valuation correction in one hardware provider could trigger a forced deleveraging of global retirement and institutional portfolios that are now heavily overweight in "AI-impacted" companies.

With the rise of debt, companies are increasingly using different investment methods to fund trillion-dollar "AI factories." The risk of massive debt is currently not accounted for and thereby concealing the true extent of financial leverage (Tunguz, 2025). These entities are increasingly using short-term and private credit to fund data center expansion by shifting liabilities to them. These off-balance-sheet mechanisms account for about 40% of AI infrastructure capital expenditure. If AI monetization slows down in 2026, a potential liquidity gap could occur even within the private credit markets that can further expand the risk. Until a systemic breakdown occurs, the absence of transparency in these private structures could mask the true extent of the risk.

5. The Infrastructure and Energy Debt Trap

One of the reasons that risk is currently not accounted for is because of the systematic nature of AI implementation which requires physical hardware to manufactured, as oppose to software growth which can scale in weeks, while power grids and data centers operate on 5-to-10-year infrastructure cycles. In addition, AI's physical requirements are creating a structural timing gap. The surging cost of gigascale facilities—now exceeding $20 billion per project—risks creating stranded assets (Allianz, 2025). Researchers are increasingly focusing on Small Language Models (SLMs) and efficient inference models, and massive, high-density clusters may become economically obsolete before their 15-year repayment cycles conclude. Financial choke points in investments have reached an energy wall, where the cost of supporting AI in North America has increased, due to increase in specialized materials. It is projected that the industry will spend $3 trillion until 2028, with half requiring external financing. As a result, firms may be unable to service their massive asset-backed loans if electricity costs or water in decrease the operational margins. Data center load is expected to nearly triple by 2028, reaching 132 gigawatts (The Dispatch, 2025). In the near future, stranded assets could result from the surging costs of building data centers—from $200 million to over $20 billion per facility (Allianz, 2025)—if newer, more efficient model architectures (like SLMs) reduce the need for massive Gigascale computing clusters. It is predicted that data centers will consume more electricity than Germany and France combined by 2030 (World Economic Forum, 2025).

To meet AI demand, U.S. utilities are projected to issue a record in debt. However, many are hitting affordability ceilings where regulators prevent them from passing these massive infrastructure costs onto consumers. This creates a liquidity gap that threatens the credit ratings of the traditionally safe utility sector. Massive investments in natural gas and "small modular reactors" (SMRs) carry a high risk of obsolescence or regulatory shifts. If AI revenue fails to materialize by the 2026-2027 "Reckoning," these $20 billion data centers and their dedicated power plants could become non-performing assets, leaving these companies exposed to significant defaults. Governments are increasingly acting as insurers of last resort for these projects. By underwriting the energy grid for private tech gains, nations are bloating their debt-to-GDP ratios, making them more vulnerable to bond yield spikes and inflationary shocks if the AI productivity fails to pay off the interest.

6. Geopolitical Funding and Sovereign Risk

As Sovereign Wealth Funds (SWFs) become the primary AI financiers, a new layer of risk is being introduced. The capital concentration consists of SWFs (primarily from the Middle East) investing billions of dollars in AI ventures throughout 2025 (EY, 2025) has increased significantly with no sign of slowing down. The risk is the result of western screening and technology transfer restrictions through political interference, billions of dollars of sovereign-funded AI infrastructure may be rendered unusable or "domesticated" as a result of geopolitical tensions (Sanchez & Co., 2021). The aggressive push for sovereign AI—nations funding domestic infrastructure to ensure data and technological autonomy—is transforming global finance into a high-stakes geopolitical arena. As countries like the U.S., China, and the UAE divert billions into specialized projects and domestic chip fabrication, they create significant sovereign risk by bloating national deficits and fostering circular investment bubbles.

Economically, this geopolitical innovation race can trigger market fragmentation and inflationary supply-chain decoupling. It can introduce systemic instability; concentrated dependencies on a few hardware providers mean that a single geopolitical event can flare-up and can cause sharp economic corrections.

Unlike developed nations that possess the fiscal space to subsidize domestic tech, many Emerging economies are being forced to choose between massive, debt-fueled infrastructure spending or a permanent loss of competitiveness. To avoid becoming "digital colonies," nations like India, Brazil, and Vietnam are launching national AI strategies. However, the high cost of specialized hardware and the energy infrastructure required to power them are bloating deficits. As the U.S. and China uses export controls, EMs are caught in a tech decoupling. Choosing a side—such as adopting a Chinese-made AI infrastructure versus a U.S.-hosted one, this can lead to financial sanctions or the loss of access to critical global standards, fragmenting domestic markets of these emerging economies.

7. The 2026 Reckoning: From Promises to Proof

There may be an event where by 2026, the economies will have transitioned from the era of "AI evangelism" to one of rigorous fiscal evaluation. This will trigger a pragmatic reset, with enterprises deferring up to 25% of planned AI spending as they struggle to tie investments to tangible revenue growth. A new benchmark for success will emerge as the market separates durable innovators from speculative laggards. "Agent AI"—autonomous systems that handle end-to-end business roles. It is possible for companies that fail to demonstrate these "million-agent" solutions by 2027 will fall into an economic trap where the cost of infrastructure outpaces the value of the software permanently.

As we move into 2026, the global economic landscape powering the AI is entering a period of "Verification Risk," where the gap between AI's trillion-dollar promises and its actual valuation can become the primary driver of market volatility. For emerging markets, the risk is even more acute: the cost of participating in the AI race is bloating debt without a guaranteed pathway to industrial growth. Institutional investors can pivoted from "FOMO" (Fear Of Missing Out) to "FOBI" (Fear Of Being In), demanding that AI projects demonstrate quarterly self-funding capability or face immediate funding termination

Conclusion: Mitigating the Looming "AI Trough"

The rapid ascent of Artificial Intelligence has catalyzed a surge in market valuations, often driven by speculative fervor rather than immediate profitability. This "AI bubble" mirrors the dot-com era, where the fear of missing out (FOMO) leads to inflated price-to-earnings ratios and unsustainable capital allocation into unproven business models. The primary financial risk lies in the unrealistic expectation of near-instantaneous returns on massive infrastructure investments. When these technologies fail to monetize at the predicted scale or encounter "plateaus" in capability, the resulting market correction can trigger systemic instability, affecting not just tech giants but the broader global economy.

AI's financial trajectory in late 2025 is a study in high-stakes speculation. In spite of the likely long-term economic gains from AI, the path to achieving them is currently paved with unsustainable capital intensity and opaque financing structures. There is less risk of technology failing than that the financial infrastructure supporting it will collapse under the pressure of $1.4 trillion in annual funding needs by 2030-a sum that may exceed current market capabilities. Focus has shifted investment from compute (infrastructure) to companies demonstrating tangible return through AI in traditional sectors by taking into account energy and water bottlenecks as primary barriers to AI's financial growth.

To mitigate these risks, a transition from hype-based investing to fundamental-based due diligence is essential. Diversification is one strategy where Investors should shift exposure away from highly concentrated AI assets toward quality assets with proven cash flows and resilient balance sheets

that can assist in mitigating the risk. Financial institutions must integrate AI to ensure that risk assessments remain transparent and subject to human oversight. Infrastructure Stress Testing should also be done, and companies should evaluate the long-term utility of their hardware investments (e.g., GPUs and data centers) against potential technological shifts to avoid massive asset write-downs. Ultimately, balancing innovation with rigorous regulatory compliance and ethical standards will transform AI from a speculative hazard into a sustainable engine for economic growth.

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