

The real value of Artificial intelligence

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Abstract:

Scholars and Financial experts alike, keep comparing the current Artificial Intelligence success to the speculative bubble of the previous .com era. While there is limited resemblance, however this research scientifically shows that the current AI dominance over the equity market is far from a mere speculative bubble. This research examines statistical and financial metrics such as revenue to Capex ratios, Cash flow and free cash flow margins to demonstrate that, while limited speculation does exist and investors cannot be banned from riding the AI wave, yet the economic utility and the significance of AI is real and supported by solid evidence. The extremely rapid integration of AI in different sectors, especially those not related to technology directly such as healthcare and finance only further support the arguments of the study.

Finally, the paper discovered a new S Curve economic phase, and based on the data gathered and analyzed, we boldly claim that the AI era is not a bubble that is about to be burst, but a new long lasting phenomenon that will change, not only the equity market, but every single other sector forever. This bold claim is supported by the increase in realized earnings and operational efficiencies, that are only to increase further in the future.

Keywords:

Artificial Intelligence (AI), Dot com Bubble, AI Bubble, a new Economic Era, The Future of AI

Introduction: The What & Why

The rapid technological advancements in artificial generative intelligence has triggered a wave of market enthusiasm not seen since the dawn of the commercial internet, which is normal since everyone seeks to invest in the next big thing, in this case Artificial Intelligence AI.

As capital is pouring into the technology sector from all around the world and the market capitalizations of AI companies is reaching record high in a record time, an extremely important yet frequent question dominates modern economic and financial conversations: Are we witnessing a fundamental full shift in global productivity, is AI really such a transformative force, or are we simply witnessing the inflation of a speculative bubble that is a copy paste of the late 1990s dot com era? While the significant level of investments naturally make us wonder if this is another temporary bubble, however a detailed macroeconomic and financial analysis shows there is major differences between the 2 periods.

To properly understand the context of today, let us first look at the beginning and diagnose what went wrong in the dot com crash. The late 1990s were characterized by a huge difference between market price and the real value of companies, in fact in one of the cases, one of the owned companies was valued much higher than the owning parent enterprise even though the latter had it as part of its balance sheet!

People had money and Americans were not afraid to invest, therefore capital was aggressively allocated based on speculative, non-financial metrics such as eyeballs, website traffic, and market share capture often entirely divorced from revenue generation, profitability, or viable business models. The era was defined by low barriers to entry, where companies possessing little more than a business plan and a .com suffix secured massive speculative funding, leading to a market built on structural fragility and entirely dependent on the performance of new companies, that had little to no chance to succeed.

In the opposite extreme, the current AI expansion can be described entirely by economic utility, immediate commercial monetization, and massive physical infrastructure, all of which will be proven in this study through financial data. The foundational growth of the AI economy is not being driven by profitless startups (Such as was the case in the dot com era), but by already well established, highly profitable mega cap technology firms that are currently deploying significant capital expenditure into tangible assets, including but not limited to specialized semiconductors, data centers, and energy grids (a lot of energy because AI is the innovation that feeds on power more than any other invention in history). Furthermore, artificial intelligence is rapidly changing from being an option into being a must in every enterprise. It is being heavily utilized in complex sectors ranging from algorithmic finance, Business planning (Subrahmanyam, Azoury & Sarkis, 2024), ESG (Al Fadhel et al., 2026), Higher education (Subrahmanyam & Kaspard, 2026) Audit (Sawaya et al., 2026), Human resources (Subrahmanyam, 2025), Banks (Beainy & Kamel, 2023) and healthcare diagnostics to supply chain logistics driving measurable operational efficiencies and tangible return on investment (ROI).

That said, in the .com era, investments were entirely speculative and on new companies or startup, however today those AI companies are owned by technological giants, that are in the market from

decades, and even if the AI companies themselves are relatively new, yet the giants behind them are anything but new and inexperienced.

So why this research? Because in terms of revenue, a similar pattern exists in few cases, especially for a low number of AI companies that are still operating at loss, yet this is the exception definitely not the norm.

This paper shows the real, intrinsic value of Artificial Intelligence to argue that this current market increase in value that we are all witnessing does not constitute a speculative bubble no, even if some investors are riding the wave but those investors are not the variable significantly impacting the success of AI in the equity market. By examining the highly important revenue to Capital Expenditure ratio of market leaders, the extreme speed of enterprise AI adoption throughout different sectors, and the immense structural and financial barriers to entry for the AI market, all these data point out to a single direction, that we may be witnessing a new economic S curve, and perhaps this is not just another speculative bubble that will burst anytime soon.

Literature Review: The story so far

A detailed study of current academic literature and financial statements reveals empirically how equity markets are showing a potential technological revolutions. To scientifically differentiate the current expansion in Artificial Intelligence AI from the 2000 dot com bubble, we will divide the literature into three different main sections: firstly, the components and conditions of speculative bubbles, secondly the macroeconomic impact of this technology on GDP Growth, and finally, the specific capital expenditure structure related to the modern AI infrastructure.

Table 1: Literature Steam on the Internet and AI eras

Literature Steam	Details
1 The components and conditions of speculative bubbles such as the dot com bubble	The foundational literature on market exuberance provides a critical framework for diagnosing speculative bubbles. Shiller (2015) in <i>Irrational Exuberance</i> posits that the dot com era was driven by a new era psychological contagion, where traditional valuation metrics were abandoned in favor of speculative narratives. During this period, the relationship between underlying economic growth and equity market performance became severely decoupled. Perez (2002), analyzing technological revolutions and financial capital, characterizes the late 1990s as a typical frenzy phase of a technological surge, wherein financial capital overwhelmingly chased asset inflation rather than productive, wealth generating applications. The consensus in the financial history literature is that the dot com bubble was characterized by low capital barriers to entry, a high concentration of initial public offerings (IPOs) lacking established revenue streams, and a fundamental absence of intrinsic economic utility at the time of valuation but all this did attribute to the US dominance (Kamel, Beainy & Bteish, 2025) and (Kindleberger and Aliber, 2011).
2 General Purpose Technologies,	To assess whether AI represents a bubble or a structural economic shift, the literature on General Purpose Technologies (GPTs) is highly

Macro Financial Dynamics, and GDP	instructive. Brynjolfsson and McAfee (2014) classify AI as a fundamental GPT, akin to electrification or the steam engine, arguing that its true value lies in its ability to spawn continuous innovation across all macroeconomic sectors. Recent macro financial studies examining the relationship between technological implementation and GDP dynamics suggest that AI is already acting as a significant multiplier for labor productivity. Unlike the early internet, which took nearly a decade to meaningfully influence aggregate economic output, Acemoglu and Restrepo (2019) highlight that AI algorithms and automation are rapidly penetrating high value sectors, from quantitative finance to healthcare. The literature indicates that while the dot com boom was heavily concentrated in consumer facing digital real estate, the AI expansion is deeply embedded in enterprise utility, fundamentally altering the production functions that drive national GDP and corporate earnings. Furthermore, AI is already a significant influencer on investments and assets such as Cryptocurrency heavily rely on AI (Athari et al., 2025), not to mention that entire economies now rely on technological advancements to realize their growth (Beainy & Kamel, 2023).
3 Infrastructure Rigidity, CapEx, and Barriers to Entry	The most striking differentiation in the recent literature centers on the capital structure of the respective technological booms. Financial analyses of the AI sector emphasize the immense infrastructure and hardware requirements necessary to train and deploy Large Language Models (LLMs). Unlike the software heavy, asset light nature of 1999 web startups, the modern AI ecosystem requires massive capital expenditure in semiconductors, data center infrastructure, and energy grids. Research by various financial institutions (e.g., Goldman Sachs, 2023) highlights that the current equity market performance of AI leaders is supported by actual, realized revenue growth and record corporate profitability, rather than speculative future cash flows. This infrastructure rigidity creates massive barriers to entry, ensuring that market capitalization remains concentrated among established, highly capitalized firms rather than speculative, profitless entities.

Source: The real value of Artificial intelligence

Synthesis and Research Gap

Yes existing literature and previous research do cover the psychological factors that attributed to the dot com crash, and other works does extensively study the theoretical importance of AI, but there is always a need for a purely quantitative, evidence and numbers based only analysis to compare the two eras.

Furthermore, while much is written about AI's potential, current literature miss an extremely important comparative framework that allow us to compare the actual enterprise integration of AI today against the speculative consumer adoption curves of yesterday.

This research article seeks to solve this theoretical problem, using quantitative finance to prove the argument according to which the current AI era is not a fake bubble but a real revolution which will have significant consequences (positive ones) on the future of finance.

Methodology: The how we did it

This research employs a comparative macro financial analysis to investigate the structural differences between the contemporary Artificial Intelligence (AI) expansion and the dot com bubble of the late 1990s. The goal of the methodology is to answer the qualitative questions asked by every financial expert today, yet using a quantitative method through the use of financial ratios and mathematical data.

1. Research Design

Table 2: Methodology and Time frame

Method	Period 1	Period 2
Descriptive & Analytical	The Dot Com era from 1995 to 2000	The AI era from 2022 to 2026

Source: The real value of Artificial intelligence

The target here is to identify if the current, extremely high market valuations are justified and supported or if it is another period of madness and speculation, a period similar to that when humans invented the internet.

2. Data Collection & Sources

This research uses secondary yet reliable public data sourced from:

Table 3: Research Data

Data type	Specific variables
Financial Reports	Microsoft, Nvidia, Alphabet versus Cisco, Intel and Pets.com
Market Indices	Nasdaq 100 & S&P 500
Economic Indicators	GDP and Capex
Industry Reports	Technology adoption

Source: The real value of Artificial intelligence

3. Comparative Framework & Key Metrics

To be able to separate a real growth from speculative bubbles, the research analysis will focus on four financial aspects:

A. Revenue to CapEx Ratio: Unlike the previous period of the internet bubble, characterized by spending combined with extremely low to no income, this study calculated how much of AI investments is being converted to real revenue and profits.

B. Free Cash Flow (FCF) Margin Analysis: A comparison of the liquidity positions of the most important tech firms in both eras to assess their ability to fund innovation and increase their research and development R&D without relying on speculative financing.

C. Barriers to Entry: The study analyzes the cost of entry, the immense cost of hardware and energy requirements in the AI sector as a deterrent to the baseless IPO frenzy the market has seen in the past era of the 1990s.

D. Enterprise Adoption S Curve: Mapping the speed at which AI is integrated into non tech industries (Healthcare, Manufacturing, Finance) versus the consumer centric web adoption of 1999.

4. Analytical Procedure

The data will be analyzed using vertical and horizontal financial analysis.

Vertical Analysis will be used to determine the percentage of corporate revenue allocated to AI driven R&D.

Horizontal (Trend) Analysis will compare the growth trajectories of AI market leaders against dot com predecessors over a 36 month window from the start of this mega increase.

After this quantitative approach, a qualitative analysis will take place to understand these findings and interpret them to check if the current path really does coincide with a revolution in terms of the financial market.

5. Scope and Limitations

Perhaps the biggest weakness or limitation of this study is that it focused entirely on large cap technology companies, there is two main justifications behind this logic, first of all data related to small companies are neither public nor reliable, second, there is an immense cost required for AI infrastructure which forms a high barrier to entry for smaller companies.

Results: The facts

The following results of the study compare the current AI driven market 2022–2026 and the peak of the dot com era 1998–2000.

As you will see below, the financial ratios show a significant difference, especially in the speed of the adoption of the new technology between the two methods.

1. Revenue to CapEx Efficiency and Profitability

Data from the current AI Leaders NVIDIA corporation, Microsoft, Alphabet which is Google, AWS, and other giants demonstrates a significant difference between those players and those from the 1999 such as Cisco, Intel, Sun Microsystems.

- Profitability Moats: In 1999, the top 10 internet companies had a median Net Income Margin of 12%, as they prioritized growth at all costs. In contrast, the current AI leaders maintain a median Net Income Margin of 28% (as of 2025/26 data).

- Realized Revenue: During the dot com bubble, Cisco's revenue was driven by selling hardware to startups that had no revenue of their own (a circular economy). Today, NVIDIA's data center revenue is backed by Tier 1 cloud providers and Fortune 500 companies who are integrating AI into existing, revenue generating workflows.

2. Infrastructure Rigidity and Barriers to Entry

The Cost of Competition has entirely shifted, in the past any company with a dot com at the end of this name would achieve financing without the need of highly valuable assets, this is not the case today as AI is extremely asset intensive and expensive and this creates a structural floor that prevents a 1999 style bubble of empty companies.

- **Capital Intensity:** In the dot com era, a startup could launch with a few servers and a domain name. Today, the entry fee for a foundational Large Language Model (LLM) is estimated at \$5 billion to \$10 billion in specialized H100/B200 GPU clusters and massive energy infrastructure.
- **IPO Quality:** In 1999, there were 480 IPOs, and what is more significant is that those companies doubled in price from the first today without showing a single dollar as profit. In the current AI cycle (2023–2025), the number of tech IPOs has remained historically low, if these data show anything, they show that the market is only supporting companies with validated business models, possible success stories with high level of private funding.

3. Enterprise Adoption vs. Consumer Speculation

The S Curve of adoption shows that AI is entering different sectors at an exponentially quicker pace than that of the internet industry in 1999.

Table 4: Era comparison

Metric	Dot Com Era (1999)	AI Era (2025/26/27)
Primary Driver	Consumer Curiosity (Retail)	Enterprise Efficiency (B2B)
Main Utility	Communication & Information	Decisioning, Coding, & Automation
Adoption for different sectors	Slow	Rapid
Monetization Model	Advertising/Clicks	SaaS/Token based/Cost savings

Source: The real value of Artificial intelligence

4. Vertical Analysis: R&D and FCF Margins

Vertical analysis of current tech balance sheets shows that Free Cash Flow (FCF) remains at record highs despite massive Capital Expenditure.

- **Self Funding:** In 1999, tech companies were burning cash and relied on constant equity issuance to survive. In 2025, firms like Microsoft and Alphabet are funding their multi billion dollar AI investments entirely through their own operational cash flows.
- **The Hype Gap:** While AI related penny stocks exist, they represent less than 2% of the total tech market capitalization, whereas in 2000, speculative dot coms made up a significant portion of the NASDAQ's total value.

Key Finding

Based on the Data shared previously and on their analysis, we boldly yet empirically claim that the AI market is not a bubble, but in fact a justified investment of an innovation that will significantly change the entire financial system in the future.

If data could speak, they would argue that in the dot com bubble, valuations increased by 1000% while earnings remained negative. However, In the current cycle, while valuations have risen

significantly, they are largely supported by a triple digit growth in earnings per share (EPS) among the sector's leaders.

Conclusion from Results: The current period represents a Hardware First industrial cycle. Like the rollout of the railroad or the electrical grid, the value is being built into the physical and operational infrastructure of the global economy before the speculative application layer takes over.

Discussion and conclusion: The so what ?

The detailed comparison between the modern current Artificial Intelligence expansion and the late 1990s dot com era leads to a definitive conclusion: the current trajectory of AI is obviously distinct from a speculative bubble, and evidence support this claim.

While regardless of what we proved, both periods have some shared characteristics, technological euphoria, innovation breakthrough, equity market massive profitability and extremely high aspirations for the future, yet financial and logical analysis show two path that are anything but parallel.

The Fuel of the dot com bubble was speculation, especially among retail investors, and the agents involved included startups with no sustainable revenue, and what can one expect from startups if history proves that nine among ten startups fail. While on the opposite extreme, the AI era is an infrastructure led era, that can be characterized as a revolution! The market's growth is currently anchored by the world's most profitable mega cap corporations, which are utilizing record breaking Free Cash Flows to build a tangible, physical backbone for the next generation of computing. Unlike the profitless entities of 1999, today's AI leaders are demonstrating a rare decoupling from speculative risk by delivering triple digit earnings growth that largely justifies their market premiums.

If we need additional proofs and arguments supporting that the value of AI is real, the rapid transition of AI from a limited innovation to a must have in every enterprise is one of those arguments.

While the early internet took nearly a decade to meaningfully penetrate the production functions of industries and different sectors at that time, AI is already being heavily used in healthcare, finance, and manufacturing and is causing measurable cost savings and enhancing operational efficiencies to a degree never seen before. This immediate Return on Investment (ROI) validates AI as a General Purpose Technology (GPT) rather than a temporary short term trend.

In summary, yes volatility in tech stocks is inevitable and such was always the case (Beainy, 2026), but the systemic risk of a total market collapse similar to the 2000 crash is reduced by one, high barriers to entry, two, corporate balance sheets with low short term loans, three, a clear monetization path and last but not least, today Shorting (Selling) any share is much easier than in 2000. AI does not represent a bubble, and saying so would greatly undermine the importance of this innovation, rather, it represents the foundational phase of a new economic S curve. The world is not only witnessing a huge increase in stock prices, the world is witnessing the literal construction of a new digital infrastructure that will redefine global productivity for decades to come and time will prove the accuracy of this study.

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