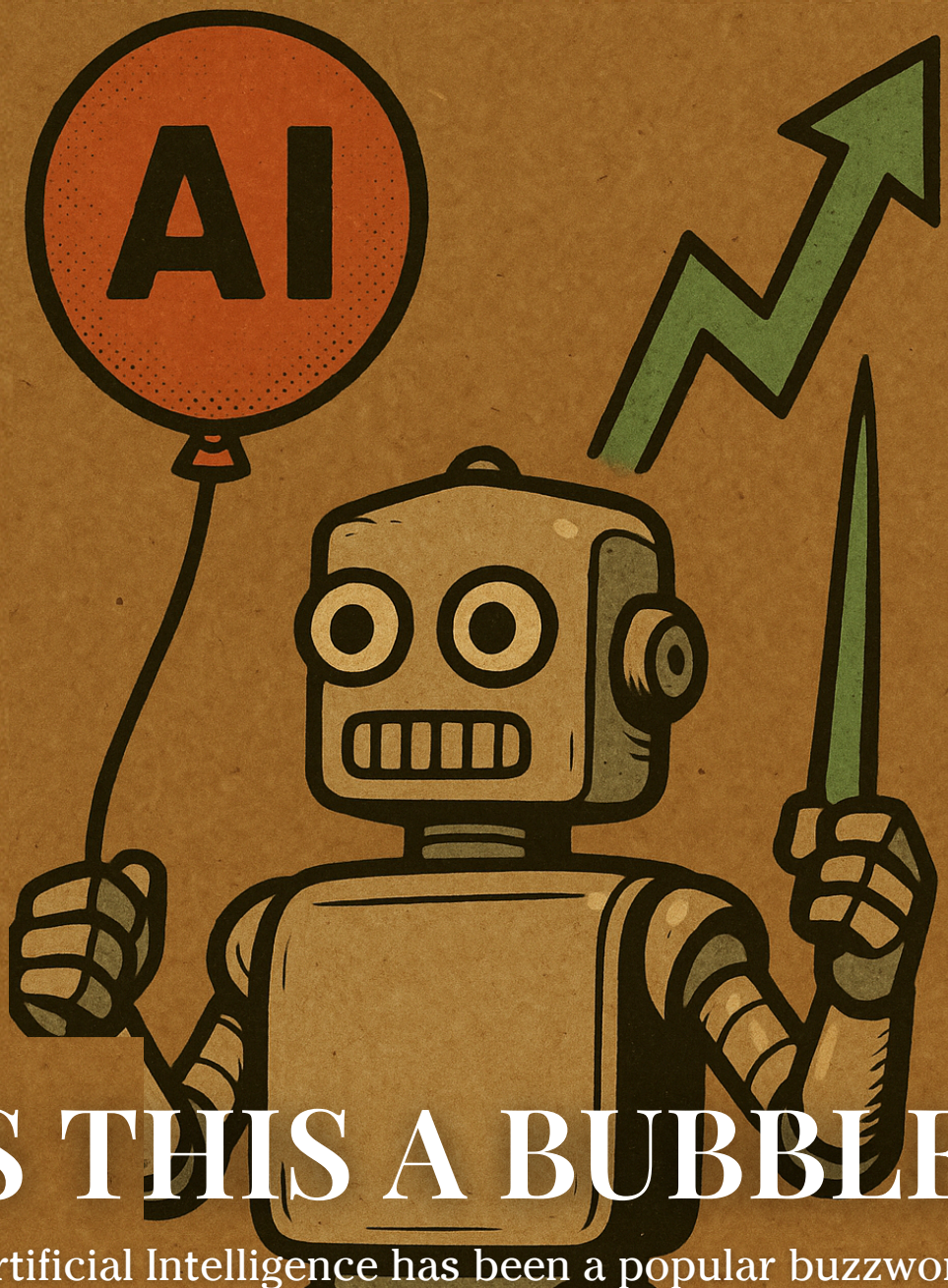
TEDU Economics Research Union *November 2025, Issue: 3*

ERUMAG

"Economics is life's business."



IS THIS A BUBBLE?

Artificial Intelligence has been a popular buzzword,
Is it a bubble that'll burst?

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COVER
ChatGPT (OpenAI), 2025

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SPECIAL THANKS TO NEJAT YILMAZ.

İzmir Economical Congress Opening Ceremony, February 1923.

Editor Note

Dr. Cavit Görkem DESTAN
Assistant Professor at TED University Department of Economics
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This issue of ERUMAG exhibits the real spark of the team of authors. They write about popular topics like AI and inflation that everyone talks about, yet they go deeper than the obvious surface. This magazine grew so rich that it can become your only source for recent economic advancements. Yes, the third issue is the charm, but I'm sure future issues will continue to enlighten us.

C. G. Destan

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WHO ARE WE?

The Economics Research Union was founded in the fall term of 2023 by Nejat Yılmaz and students of the Department of Economics. The aim of ERU is to bring students together to examine the past, present, and future of economic science, to conduct research, to evaluate the Turkish and the world economy, and to organize workshops. Believing that "Knowledge is a treasure that increases as it is shared," ERU aims to increase the popularity of scientific work among university students by organizing seminars with academicians who are experts in their fields. This journal has been prepared by ERU members for anyone who is interested in economics and who wants to improve themselves in the field of economics and increase their knowledge.

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Jinping and Trump, two actors of the trade war.

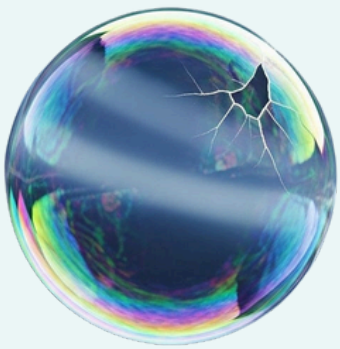
Winter is coming, or not?

Ezgi Eylem ERDOĞAN
Economics 3rd Grade Student

Humanity has attempted to explain many events beyond its understanding through curiosity and imagination. All innovations and the power they create are derived from the pursuit of a dream. Even before the establishment of modern concepts of artificial intelligence and technology became reality, they had already taken root in humanity's imagination through books and films. The central question is: In the age focused on AI and technology, can we say that humanity's long-cherished dream of creating superior intelligence technology has finally become a reality, or have people's expectations been bubbled?

The massive gap between popular culture's expectations about AI and technology and the reality it presents today actually offers a critical window to understanding the cultural anatomy of the current AI bubble. Imagine a world where flying cars zip through the skies, conscious robots and human-like AI seamlessly blend into our lives. While we dream about these incredible advancements, the reality is that we have yet to achieve them. This cycle of inflated expectations followed by disappointment is known as "AI winters," and it's not new. AI has weathered it before.

Instead of high expectations, some systems can predict but not think, generate visuals but not understand without seeing, and speak but not understand without listening. This gap persists due to a variety of factors, both cultural and technological, which are related to each other. Naturally, the media often romanticizes the capabilities of AI, creating an allure that blurs the line between fiction and achievable reality. Technologically, the complexity of replicating the human brain and emotional intelligence in machines remains a powerful challenge, requiring breakthroughs in areas like data processing, machine learning, and neural network development. Therefore, humanity's long-standing desire to create an independent-thinking being seems to be coming true through artificial intelligence, but it's still a bit of a fairy tale. Flying cars, conscious robots, and human-like AI have yet to become a reality.



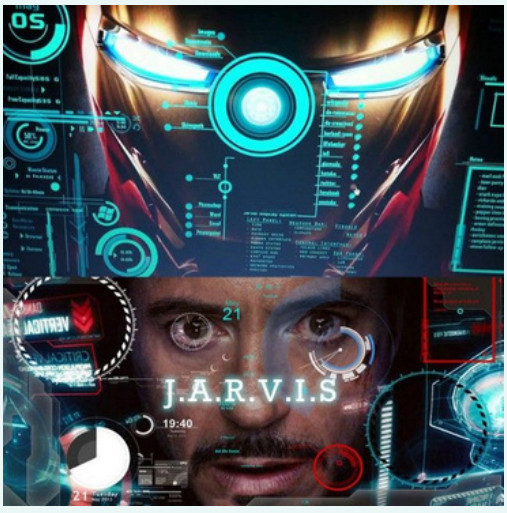
What about the flying cars?

The flying car is a great example of how science fiction can sometimes have unrealistic expectations when it comes to technology. The way it looks in the movies is often more important than whether it would actually work in real life. This can create numerous cultural expectations that are difficult to fulfill. Just like “Back to the Future Part II ” vision of October 21, 2015, a date when flying cars would dominate transportation. When Back to the Future Part II sent Marty McFly forward to October 21, 2015, director Robert Zemeckis filled the screen with flying cars and hovering skateboards. Yet when that specific date arrived in our timeline, the skies remained empty of traffic, revealing that humankind's most beloved dream of tomorrow was, ultimately, just a miscalculation of how constrained not by the imagination, but by the physical and economic limitations of reality.

mariothemultipla.wordpress.com/

The most intelligent being on the planet

The dream of creating a non-human superior intelligence being, which has been the theme of many movies and books throughout history, leaves artificial intelligence technologies in the reality of 2025. These technologies, which have developed rapidly in the last 5 years, have become a large part of our daily lives with applications such as ChatGPT, Gemini, etc. However, these magical super-intelligence beings are far away from the systems that we see in reality. Perhaps no comparison better highlights the gap between fiction and reality than the difference between Tony Stark's JARVIS (Just A Rather Very Intelligent System) from Iron Man (2008) and today's ChatGPT. These fiction-shaped expectations produce concrete real-world consequences: economic reluctance toward AI investment and psychological fear surrounding technological advancement.



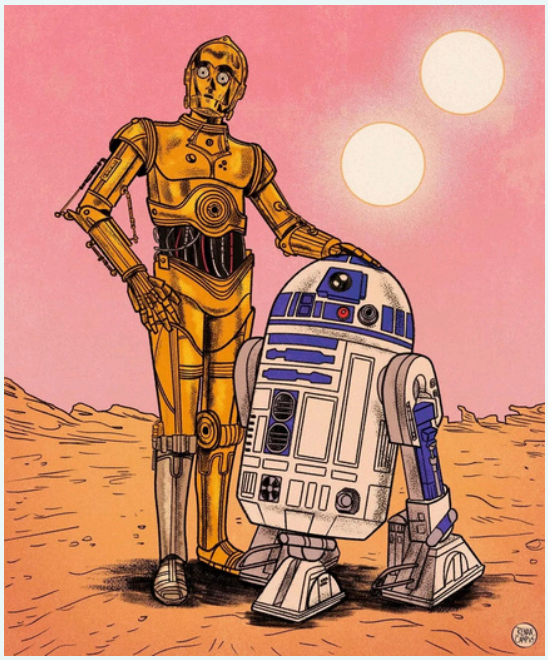
The performance gap between these two systems exceeds the capabilities of today's technology. While modern GPT models boast impressive abilities, they operate on fundamentally different principles.ChatGPT cannot truly understand context; it predicts the most statistically likely next token based on patterns in training data. It has "limited features" and "works on code," making it far less intuitive than fiction suggested.

Most critically, it "does not always fully understand the context" and "can provide answers that are irrelevant or inappropriate to the situation." While JARVIS in fiction represents artificial intelligence with consciousness and comprehension, GPT represents narrow AI, sophisticated pattern matching without genuine understanding.

In this context, the influence of fiction becomes particularly evident, as popular films and literature have reflected a shift in thinking about AI, leading audiences to perceive it as something more than merely human-like. This anthropocentric perspective serves more than just a narrative purpose; it fundamentally shapes how viewers perceive real-world AI, encouraging the belief that machines can embody distinctly human features, such as consciousness, empathy, or even personal identity. Thus, the persistent depiction of AI as human in fiction not only blurs the line between machine and person in the public imagination but also prompts society to reconsider and renegotiate the boundaries of humanity itself.

bernardmarr.com

In many stories, it's important to understand the reactions of the audience to different AI portrayals. For example, movies like Star Wars include characters like R2-D2 and C-3PO, as well as droids fighting for villains. Similarly, Black Mirror features episodes that portray technology in both positive and negative ways (Nader et al., 2022). When examining these dark, futuristic themes in fiction, robots and artificial intelligence emerge as dominant narrative elements, with the "machine rebellion."



Under this theme of revolution with superior intelligence technologies, we see a fear created by both psychological and economic systems. The ongoing attention on catastrophic AI scenarios has led to what Nader et al. (2022) refer to as entertainment-driven belief systems. They found that individuals who perceive AI as being accurately portrayed in entertainment media are more likely to visualize apocalyptic robots. This phenomenon contributes to genuine economic concerns and psychological fear regarding technological advancements.

While millions of investments and innovations continue, when we look back at society, one of the reasons for these AI winters is the idea that AI tools, far from the intelligence of Jarvis, are spreading and produce false or fabricated information, referred to as “hallucinations.” This is not just an error; it leads to direct trust risks for leaders and employees and financial and emotional losses in business processes. According to a recent survey by Prosper Insights & Analytics, 43% of executives, 36% of business owners, and 34% of employees are particularly concerned about the possibility of AI generating inaccurate data. The ability of a seemingly “humanoid” and confident response system to produce results without understanding context or accuracy is one of the most essential causes of broken trust (Drenik, 2025).

Thus, it is just these “humanized” AI narratives that seem to stimulate the bubble: While movies and novels present AI as an actor that is accurate and super-intelligent, in real life, AI behavior is often pattern repetition, out of context, and disappointing in some critical scenarios. While people are used to a super assistant like JARVIS that knows the truth in every situation, models like ChatGPT can give misleading answers due to the limitations of a predictive algorithm.

In addition to the existence of all these miscalculated predictions, the existence of expectations that have become reality is also a fact. Popular expectations from 30-40 years ago that the internet and mobile phones would be normal and common technologies in today's world have been fulfilled, and perhaps they are now as normal and common as air and water. It is not just mobile phone technologies but also flat plasma televisions and video chat technologies that are now more adapted to the world than ever before. Although flying car technologies are not mentioned in modern technology, we cannot deny the reality of these and many other technological expectations from fiction.

The AI bubble, like the absent flying cars and unconscious chatbots, reminds us that "fiction can help us imagine things differently, to see our world, and our present, in a different light," but it cannot predict or dictate what technology will actually become. As we navigate this latest hype cycle, history's AI winters teach us that the crash comes not from technology's failure, but from expectations' excess.

Reference:

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Learning: The Power Beyond Diminishing Returns

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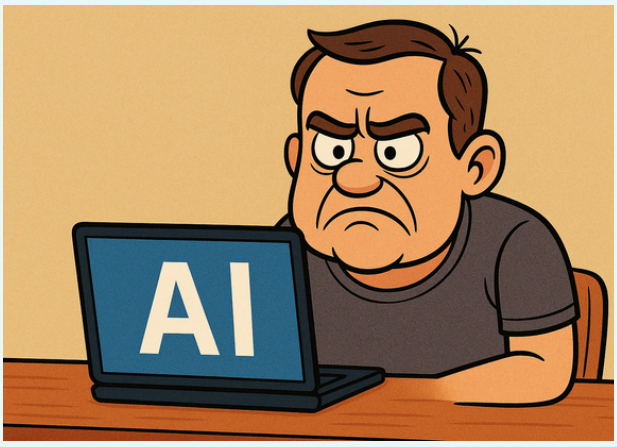
There is a rule in economics called the “law of diminishing marginal returns.” According to this rule, if you keep adding more and more of the same resource to a production process, after a while each additional unit will not be as productive as the previous ones. An input that was very useful at first will eventually start to contribute less and less. This idea applies not only to agriculture, factories, or production lines, but also to human knowledge production, learning, and technology use. Today, artificial intelligence (AI) provides a very good example of this. When we first start using AI, its impact is huge. Tasks that used to take hours are completed in minutes, texts are easily written, and analyses and graphs are generated instantly. During this period, the “marginal benefit,” or the efficiency we gain from each new use, is very high.

However, after a while, things become routine. We use the same commands and methods, and the results no longer seem as impressive to us. In other words, the additional benefit provided by each new use begins to decrease. This is where “diminishing marginal efficiency” comes into play. This is actually very natural. Because at first, the excitement of learning something new triggers the brain's reward system. But when we repeat the same thing over and over, this effect diminishes. If knowledge is not renewed, productivity also slows down.

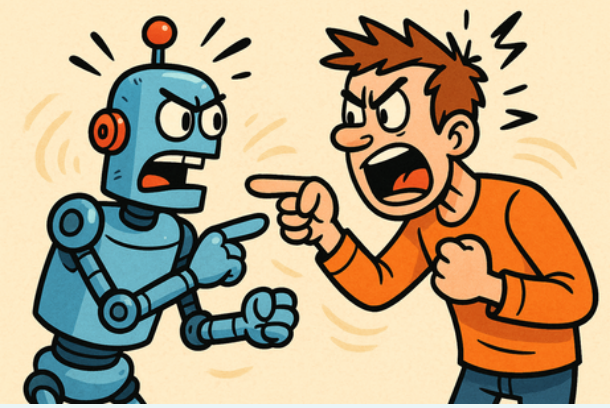
In a sense, the “learning curve” flattens out. But there is a positive side to this process: diminishing returns do not have to be permanent. As people continue to learn new things, productivity can increase again. In economics, a similar process is called “technological progress.” As technology advances, it becomes possible to produce more output with the same inputs.

On a personal level, this means investing in learning. In other words, instead of repeating what they already know, people learn new skills and discover new tools. This raises their production capacity. For example, someone who only uses artificial intelligence to write will get bored after a while. But if that same person starts using this technology in different areas, such as data analysis, presentation design, or coding, their productivity will rise again. This is because they are now using the same tool in a broader context.



This means that the production function has shifted upward. In short, diminishing marginal productivity often stems from stagnation. Productivity declines when there is no new knowledge, no new experience, and no new ways of doing things. But learning breaks this stagnation. Every new piece of knowledge expands the system's boundaries. Psychologically, this cycle is also motivating.

The brain loves novelty; when it learns something new, it releases dopamine, making the person feel more productive and motivated. This shows that learning is not only a source of knowledge but also a source of motivation. Ultimately, a decline in productivity when using artificial intelligence or another tool is an inevitable starting point. But this does not mean that progress has ended. On the contrary, that point of decline actually signals the beginning of a new learning period.



Individuals or organizations that invest in learning change their mode of production. They no longer just do “the same job faster” but gain the capacity to “do new things.” Thus, they transcend the law of diminishing returns. In today's information age, the most valuable resource is not money or time, but learning capacity. No matter how powerful AI is, it is the human desire to learn that ensures the sustainability of the productivity gained from it. In other words, it is not technology but the human investment in knowledge that is decisive.

Consequently, when productivity declines, one must continue learning rather than stop. Because every decline can actually be the beginning of a new rise. In economic terms, the law of diminishing marginal returns loses its validity where learning investment exists.

The AI Money Machine

How to justify these cashflows?

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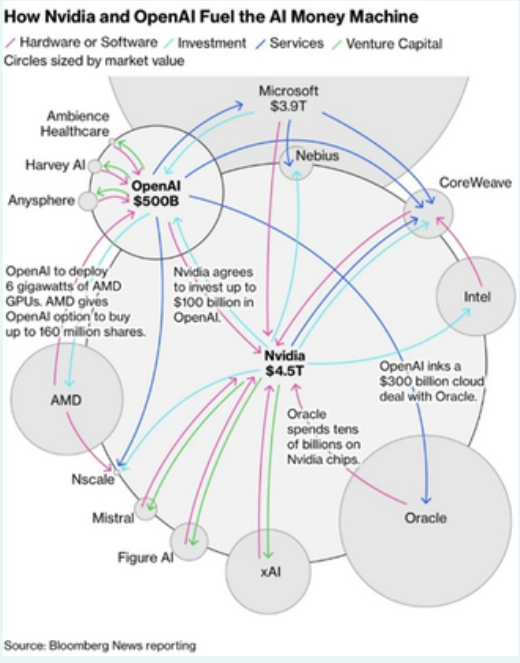
Economics/BA 3rd Grade Student

So, wrap it up, OpenAI reported a 300 billion USD multi-year agreement (from 2027) for cloud computing, which is among the biggest in history, with Oracle, a network company. Oracle, in turn, buys tens of billions of dollars of NVIDIA chips to run that cloud; Microsoft partners with (and invests in) OpenAI and hosts its models on Microsoft Azure (which also runs on lots of NVIDIA GPUs). Nvidia agrees to invest up to 100 billion USD in OpenAI while selling GPUs across the ecosystem; OpenAI also made a deal to deploy 6 GW of AMD GPUs (with an option to buy up to $160M of AMD shares). CoreWeave, and other AI clouds provide services to OpenAI and other AI model builders, who are powered by NVIDIA; venture capital and strategic money flow into startups like Mistral, Figure, Ambience, Harvey, xAI, and Nscale, which then buy compute from those same clouds. It means that sending more cash back to NVIDIA and Oracle/Microsoft, which brings the loop right back to OpenAI.

The modern days Artificial Intelligence (AI) is defined by a complex and deeply connected ecosystem of capital, hardware, and services. This network, which can be referred to as the "AI Money Machine" is not a traditional supply chain but a multi-directional relationship where the roles of investor, supplier, and customer are blurred.

At its core there are magnificent technology companies like NVIDIA, OpenAI, Oracle, Microsoft, and AMD, whose strategic and financial decisions are shaping where the global technology sector goes to. Their interactions are characterized by financial commitments, capital flows, and a race to build the foundational infrastructure for the next generation of intelligence, which is updated almost every day. This maps the architecture of this cash flow by its unique "circular financing" model to achieve computational power at a massive scale.



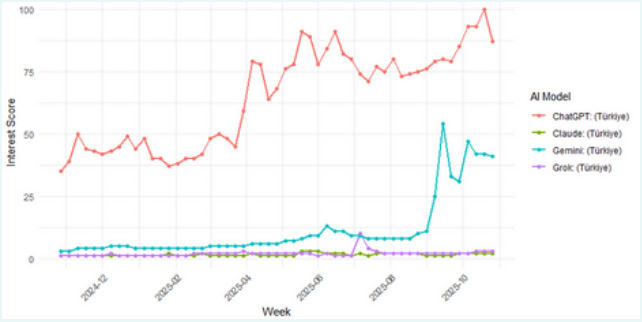
With a market valuation of 4.5 trillion USD, NVIDIA is at the center of the model with its feature of being the primary hardware provider and core of the AI hardware ecosystem (Microsoft, 2023). Its Graphics Processing Units (GPUs) represent the initial point of the AI value chain's hardware side, which is essential for both training and running advanced models. This means massive expenditures of other key players like Oracle, which is spending tens of billions of dollars on Nvidia chips to improve its cloud capacity, and OpenAI's entire technological roadmap is determined by whether they have access to Nvidia's GPUs.

Valued at 500 billion USD, OpenAI contains ecosystem's central demand driver, as it is used by a wider audience, not only with LLM (chat-based) but also with its text-to-video and text-to-image models (Sora for text-to-video and the former DALL-E/GPT Image for text-to-image). Its commitment of more powerful AI models creates an increased need for computational resources, which "fuels" the entire cycle. This demand has been reflected in some of the largest deals ever recorded, including an agreement of 300 billion USD, five-year cloud agreement with Oracle for 4.5 gigawatts of capacity starting in 2027, and a strategic partnership with NVIDIA to deploy at least 10 gigawatts of its systems.

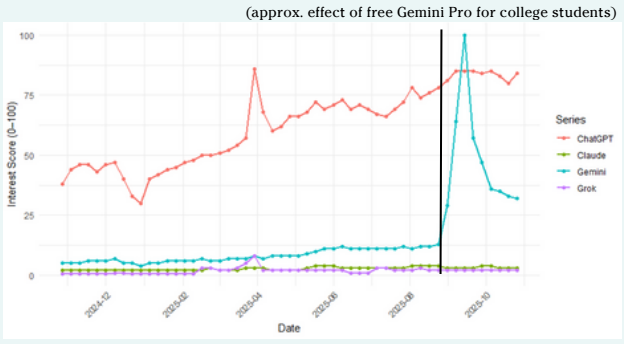
1. Economics of The AI: Platforms, Complements, and Scale Effects

The relationships in generative AI often have a platform-like structure, especially after the advancements of ChatGPT. For example, OpenAI's API platform connects developers, who fine-tune models or build applications, with end-users who consume AI services. Similarly, cloud providers like Azure serve as platforms linking AI model providers with enterprise clients and governments to satisfy their need for AI services. In classic two-sided market theory, the platform's value comes from cross-side network effects, more AI developers or model providers can attract more end-users, and vice versa. This would be a reason why ChatGPT outperforms other AI models.

We see hints of this: Microsoft's Azure benefits by hosting exclusive OpenAI models, attracting enterprise customers to Azure who want GPT capabilities, and giving OpenAI a larger user base (via Microsoft's enterprise reach) and more usage data. The pricing structure often exhibits cross-subsidy: such as Microsoft heavily subsidized OpenAI with credits, such as below-cost cloud services to grow usage on Azure, expecting to get enterprise revenues, similar to how gaming consoles sell at a loss to build a user base to sell games. Likewise, end-users initially got free or low-cost access to ChatGPT, which is subsidized by venture capital and cloud credits, to build network effects and a dataset of interactions.



Google Trends, last 12 months, Türkiye.
(Graph by Arda Akgül)

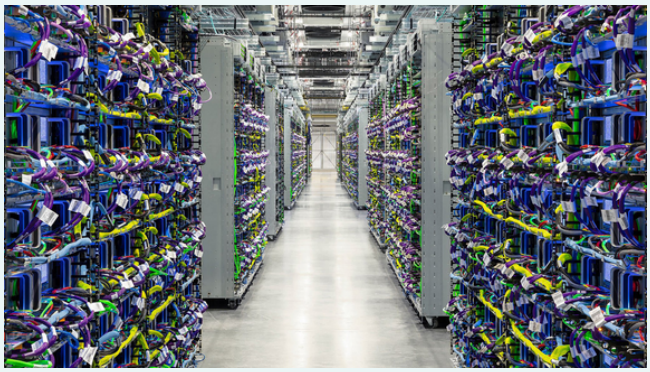


Google Trends, last 12 months, worldwide.
(Graph by Arda Akgül)

Platform competition is emerging in the AI sector. We have competitors like AWS, Azure, and Google Cloud each want to be the main ecosystem for AI services, and they compete by tying up with model providers. Anthropic aligned with Amazon, OpenAI with Microsoft, and Google with its internal models and open-source releases. Each platform is trying to attract both the producer side (AI model developers) and the consumer side (businesses and developers) to its environment.

Another aspect is that generative AI benefits from training and scale economies. At a technical level, there are scaling laws, empirical relationships showing that model performance improves as a power law of model size and training compute. In practical terms, larger models trained on more data have consistently resulted in better accuracy and capabilities across many tasks, even though it is with diminishing returns. This creates a strong support to scale up, which may lead to a race where each generation of model (GPT-3, GPT-4, GPT-5, and thinking models like o3) is computationally more intensive than the former models. This scaling is only eligible for those with access to compute resources, so there we see first-mover advantages too. There are also economies of scale on the cost side, cloud data centers apply high fixed costs (electricity, water, climation etc.) but low marginal costs (1.25 USD per 1M tokens for GPT-5 as of October 2025).

Indeed, hyperscale cloud providers count on high utilization rates, which ends up in spreaded fixed costs of data centers on millions of users. This suggests a potential "money machine" dynamic. As a model is built, serving an additional customer (especially via an API) is cheap, so at a large scale, revenue could exceed operating cost if usage scales up.



Data Center for GPUs to train/infer AI

That was what Oracle CEO said:

"Just look at the rate at which they've grown to, you know, almost a billion users."

They believe that OpenAI will pay the cost to Oracle for cloud computing, because their usage is growing as there are more users (CNBC, 2025).

The last factor is cost reduction. AI firms find ways to optimize models through algorithmic improvements like model compression or more efficient architectures, or using less GPUs like what DeepSeek did. These improvements can lower the compute needed for a given performance or upgrade one. The cost-performance frontier may go to the right without going up.

2.Capital and Contracts

Developing initial models and the cloud clusters to run them requires billions of capital, which is far beyond typical startup funding. We are witnessing a bunch of funding sources, like large tech companies' balance sheets, such as Microsoft's investments in OpenAI, Google's capex on AI, venture capital and private equities like 10 billion USD raised by OpenAI, Anthropic, etc., and even debt financing.

For example, OpenAI's revenue structure initially relied on Microsoft's equity and advance purchase of Azure credits. By 2025, OpenAI also used debt markets as JPMorgan led a 2.3 billion USD loan to OpenAI and its partners to build the Texas data center for the Stargate Project. Meanwhile, smaller players compared to Microsoft, like CoreWeave, raised money in several rounds, like 200M USD in 2023, and took on debt to buy GPUs, and they use the hardware as collateral (Reuters, 2023).

A key trend in recent AI deals is the use of long-term capacity purchase agreements. For example, OpenAI's promise to spend 250 billion USD on Microsoft's Azure cloud actually guarantees Microsoft a large, steady income. Even if OpenAI finds cheaper options later, it still has to pay Microsoft or lose that money. Similarly, the 300 billion USD deal for 5 years between OpenAI and Oracle likely means OpenAI must spend a big amount each year on Oracle Cloud. These promises help fund new data centers, because Oracle knows it has a committed customer and can safely invest in building GPU farms.

Some deals also include options, which are rights to future profits. For instance, OpenAI's right to buy up to 10% of AMD stocks acts like a call option, so if AMD's AI chip business grows, OpenAI can make money (AMD, 2025). Microsoft has used similar structures, such as getting part of OpenAI's profits up to a certain limit. These financial designs help manage uncertainty and share both the risks and potential rewards of AI's future.

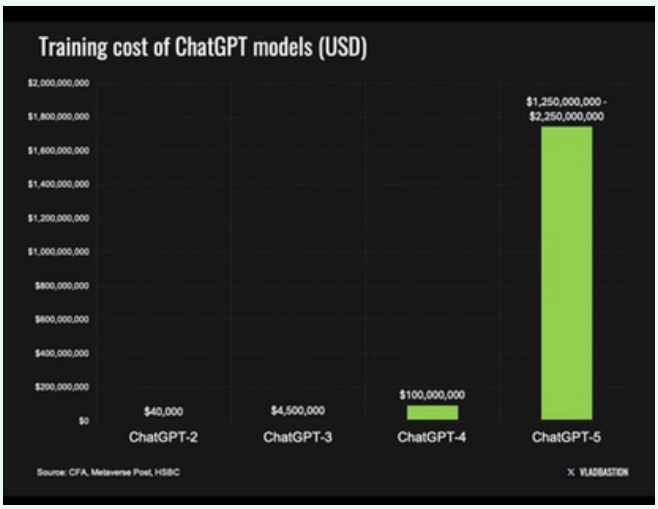
From an investment perspective, building AI capacity is risky and costly, and when a huge amount of money is spent on data centers or training, that money can't easily be recovered. So companies invest in responsibility and keep flexibility. For example, the Stargate project starts with 100 billion USD and may expand to 500 billion USD only if things go well (Reuters, 2025). Each step is like an "option" to keep investing if conditions are right.

Firms also protect themselves by working with several partners. OpenAI uses Azure, Oracle, and CoreWeave, so if one provider becomes expensive or unreliable, others are available. Cloud providers do the same, however. Microsoft works with OpenAI but also other startups, Amazon diferentiate investments between Anthropic and its own models, Google supports multiple AI labs, including its DeepMind.

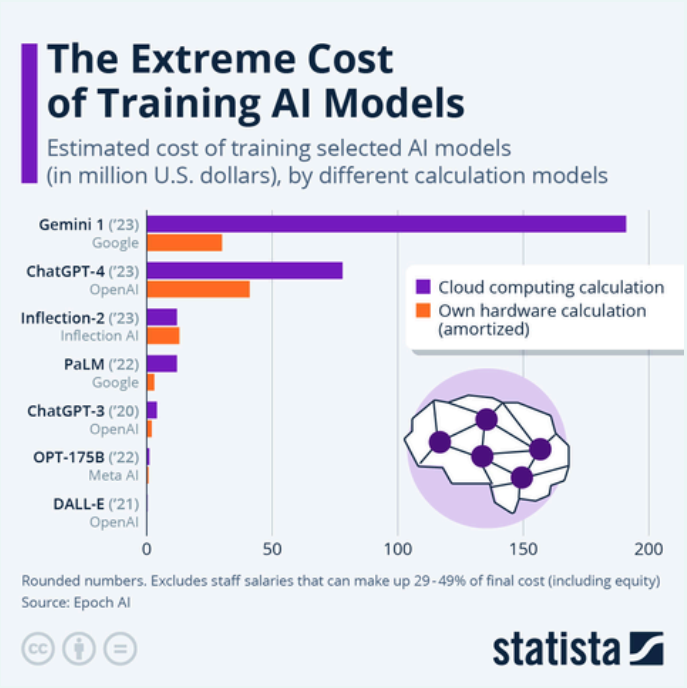
The AI boom is being funded by a bunch of equity, debt, and long-term contracts. Big firms often give startups upfront money in exchange for future revenues or shares. The logic of "real options" is to have a flexible and staged investment. It is visible throughout. Finally, governance is adapting to these unusual partnerships by balancing its profit with public benefit. How well these financial structures are will shape whether AI investment continues or slows down if profits take too long to appear.

3.Cloud Computing and Inference Cost

Training a large model is an expense that is paid once that involves running a huge number of computing operations with special tools like NVIDIA's H100 GPUs. For example, training OpenAI's GPT-3 (175 billion parameters) has been estimated to require on the order of 3.14×10^{23} FLOPs (floating-point operations) (Sevilla et al., 2023). On regular GPU hardware, that translates to a time cost on the order of thousands of GPU hours, which would cost roughly 500k USD to 4.6 million USD in cloud compute cost for a single training run of GPT-3, depending on hardware efficiency assumptions. GPT-4, which is larger and trained on more data compared to GPT-3 costed significantly more. So that we may say that recent new GPT models will cost more and more due to diminishing marginal returns, as data to train is more in shortage so that training a new model would require more computational power.



These are largely sunk costs. Once you train the model, that money has been spent on electricity and hardware.



(Buchholz, 2024)

Once a model is trained, every time it's used for inference, like generating output from inputs, it consumes computational resources. Inference cost scales with the model's size and the complexity of the query (length of input and output tokens). For GPT-3 models, 1k token output costs on the order of 0.0003 USD per query in computation. OpenAI's API pricing for GPT-3 was about 0.002 USD per 1k tokens, implying a healthy margin over the raw cost (Appenzeller et al., 2023). However, when multiplied by millions of users and complex multi-turn interactions, inference costs increase quickly. In fact, total inference costs can far outweigh training costs in the long run. Inference is like an operating expense, occurs every time the service is provided. It means that "Hello **GPT, how are you today?"** costs even some cents. If a model is extremely popular, the aggregate GPU time for inference can exceed that of training by orders of magnitude over the model's life. Because training is once, but inference is continuous, in fact, 24/7.

Cloud providers charge for inference usage typically on a token basis, which means model providers have ongoing bills. For example, OpenAI's API runs on Azure; OpenAI pays Azure for each GPU-hour consumed to answer API calls, even though it is likely at a discounted rate if under their contract. If OpenAI's revenue per API call does not sufficiently exceed the cloud cost, margins are thin. This has motivated efforts to optimize inference: methods like model compression, quantization, hardware acceleration, and caching frequent results cut costs per input and output. There is also a trade-off in model size too, so that a smaller model is cheaper to run, but may be less accurate, and it would hallucinate more. Companies are exploring distilled models to handle special queries and save the big model for hard cases, a form of cost-tiered service.

Sam Altman, OpenAI CEO

The cloud model means that AI companies often do not directly own the machines, they rent them via AWS, Microsoft Azure, and Oracle's services. You can scale up to thousands of GPU instances when needed and scale down in off-peak times, it means. Elasticity is extremely valuable for training, which might use 100% resources for peak times and then none) and for variable inference loads. Cloud also converts fixed costs into variable costs, which is helpful for startups to avoid huge upfront capital outlays for hardware.

This is why even OpenAI uses Azure, it is also co-investing in dedicated data centers (Stargate) that it will effectively control; and why Meta and Google mostly use their own data centers for AI. It depends on their analyses.

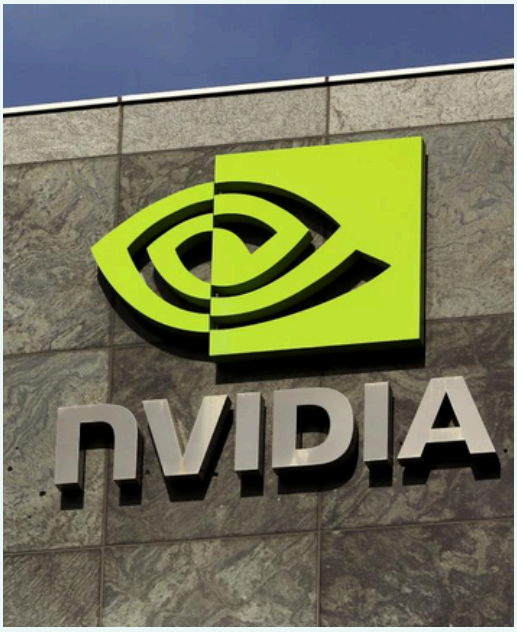
The big three clouds (AWS, Microsoft Azure, and Google Cloud Platform) charge a premium, as they offer a brand and full services as well as a reason for their ability to charge more. Specialized clouds such as CoreWeave and Lambda Labs offer lower prices by optimizing purely for AI workloads and foregoing some features. So that a huge cost is varied by the companies themselves.

> "For instance, let's say ERU AI is a tool to analyze financial statements of companies listed in BIST. ERU AI does not need to have computational tools or data centers, rather, ERU AI can use cloud services to run their own models and APIs to run their AI services via various AI companies. So that fixed cost like the rent of the data center is turned into a variable cost, usage and users; in other words, queries.

4. How to Justify the AI Money Machine?

As a person who highly believes in technological advancements and who is highly interested in artificial intelligence, justifying the cash flow is just something difficult. However, there are ways to make it sustainable in terms of the financials of companies.

It would be said that the clearest validation would be the state that companies involved in the AI value chain start reporting sustained profits directly attributable to AI services. For example, if OpenAI (or its investors like Microsoft) can show that the revenue from ChatGPT/Sora not only covers the ongoing cloud costs but also the R&D investment within a reasonable time series, that's a strong indicator. If Azure's gross margin improves due to economies of scale in AI (or the ability to change pricing because of high demand), and if those margins hold even though competition increases, it suggests the "AI money machine" is printing money. So that high and growing margins on AI services would reflect that each additional dollar of AI revenue comes with a relatively low cost; the marginal cost is so low that it is the ideal money machine scenario.



It's also worth noting signs of failure, if the investments never break even, or if diminishing returns is showing, such as scaling models further yields little new value but still costs exponentially more and more, a scenario of hitting a wall on the quality improvements, then the machine might work not better. For instance, if GPT-6 requires billions more but provides only marginal gains that it will not be worthly, AI money machine would stop working at all. It would end up in a state where we would see that in perhaps flatter user growth as people would stick with slightly older and cheaper models such as GPT-4o. Another negative sign would be if externalities or regulation impose heavy costs, like a carbon tax significantly raises operating costs, or strict data usage regulations that would limit these models to slower growth of AI levels.

As the data on AI accumulates, researchers and policymakers will be able to judge whether generative AI is truly a new engine of economic value creation or simply a costly fascination or a fake cash flow tool, as believed by a lot of people, including Michael J. Burry. The metrics and frameworks discussed aim to ensure that as we build this machine, we also measure its output and adjust ourselves accordingly, so that maximizing societal benefit while preventing problems would be provided.

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Inflation, Uncertainty and AI: Interview with Prof. Dr. Erdem Başçı

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Arda AKGÜL
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Prof. Dr. Erdem Başçı, Arda Akgül and, Mustafa Boydaş during the interview.

In a period marked by transitions, the global economy is adjusting to shifts toward trade patterns, evolving energy markets, post-pandemic recoveries, changes in labor and impacts of artificial intelligence. To this point, supply chains are being reorganized, monetary policies are calibrating itself to changing inflation dynamics, and firms are reassessing investment plans due to technology adoption and updates in laws, regulations and policy changes. Financial conditions differ across regions and economies such as developed and developing, capital flows and exchange rates are also impacted, while demographic trends and productivity developments continue to shape growth prospects.

These factors would bring uncertainty but also clarify the constraints and trade-offs that policymakers, businesses, and households face. Within this context; Prof. Dr. Erdem Başçı, faculty member in the Economics Department at TED University, former Governor of the Central Bank of the Republic of Türkiye, former Ambassador and Permanent Representative of Türkiye to the OECD between 2016-2021 and currently, Academic Advisor to the TED University Economics Research Union, provided structured reflections. Prof. Dr. Başçı answered questions from Mustafa Boydaş and Arda Akgül by addressing monetary transmission, price stability, financial intermediation, and considerations for policy design and market expectations.

1) Most discussed topics in the global economy in recent years have been inflation, uncertainties, and artificial intelligence. In your opinion, why have these three concepts become so critical?

All three have serious importance for the society at large, and all three rose rapidly and unexpectedly.

When Nobel laureate economist Thomas Sargent published his book titled "The Conquest of American Inflation" in 2001, no one expected inflation to reappear as a problem, until the pandemic in 2020.

Since the establishment of the World Trade Organization in 1995, efforts were directed toward removing barriers to international trade, and at least tariff rates remained durably low globally, reducing uncertainty there, until the changes in the stance of the US administration in 2018 and 2025.

When public research funding for artificial intelligence was completely cut in the 1980s, no one expected AI to develop rapidly and not only become part of our daily lives but also lead to rooted and rapid changes in economies and the world of work. All of these took place after the "deep learning" revolution in 2010.

2) While considering that inflation rose after the pandemic, do you think today's high inflation has been driven more by supply shocks or by demand-side policies?

Research on this field especially points to demand-side factors playing a larger role in the rise of inflation in the US. In addition to expansionary monetary and fiscal policies, I also think that the loosening of macroprudential policies played an important role on excessive monetary expansion after the pandemic.

In particular, the ability to use bank capital adequacy ratios countercyclically became possible during the 2020 pandemic shock, and this was very effective in reviving the money-credit mechanism. In 2009, this tool could not have been used, because the problem at that time originated in the significant erosion of banks' equity capital base.

3) How are inflation dynamics changing for emerging economies?

The key role of expectations once again reflects itself in inflation dynamics. This is especially so in emerging economies. As using expectations themselves as the nominal anchor may become more difficult in these countries, the difficulty increases particularly when inflation expectations become heterogeneous. In such cases, I think it would be useful for nominal money-credit growth to once again assume the role of a of a supporting nominal anchor.

"... nominal money-credit growth to once again assume the role of a supporting nominal anchor."

4) How do global sources of uncertainty such as wars, geopolitical risks, and rising protectionism affect inflation?

Protectionism can, have a one-time effect that raises the price level in the country that implements it. Whether this turns into sustained higher inflation depends on the policy response of the central banks. If an inflationary policy is implemented and the nominal anchor property of expectations is eroded, this can indeed turn into inflation. A similar argument applies to geopolitical shocks, for example through energy price hikes triggered by them.

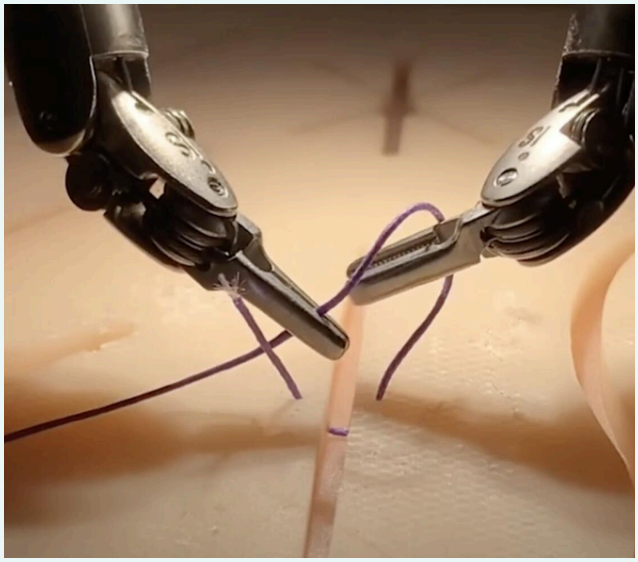
On the other hand, concerns about the possibility of excessive and unwarranted expansion in monetary policy, and the uncertainty surrounding this, can have a lasting adverse effect on money demand and may, in the long run, trigger a significantly high inflation.

5) For emerging economies, is artificial intelligence an opportunity, or is it a new risk that increases dependence on advanced economies?

I think the opportunity side is greater. Learning these technologies is not that difficult. Finding sufficiently powerful hardware is also quite easy these days. Emerging economies which can adapt their education systems will be able to obtain net benefits from the presence and further development of artificial intelligence technologies.

6) How should we evaluate AI's role as a complement or substitute from an economic perspective? What should be the priority policies for collaboration between universities, private sector and the public sector in terms of efficiency?

Progress in image recognition and speech recognition technologies accelerated considerably after 2010. Progress in this area may, for example in disease diagnosis, be complementary to physicians for now but more substitutive in the long run. However, in a field like robotic microsurgery, the complementary effect will be more prominent.



*A surgeon robot that performs with a performance of human (Johns Hopkins University)**

7) Considering the digitization of money definitions (stablecoins and CBDC), does the increase in financial inclusion have a disinflationary effect, or does it intensify demand-side pressures?

Central Bank Digital Currency (CBDC) can be considered, within the textbook definitions, as the closest substitute for paper money. As a liability of the central bank, this type of money can be safely used in purchases and debt payments, and "smart contract" features can also be easily added to it. It is more likely that this type of money would substitute for paper currency rather than be inflationary.

Special type of digital tokens labelled "stablecoins" will not be a problem as long as they are backed on a full reserve basis by fiat currencies or safe public securities. However, the question of how and by whom these reserves will be audited has not yet been clarified. This private form of money can become inflationary to the extent that of the growth rate of its balances and the degree that they facilitate the monetization of government budget deficits.

8) Do you think digital currencies like CBDC and stablecoins will become the primary payment methods?

CBDC is already being designed as a convenient and low-cost payment tool, including for cross-border payments. Therefore, for a country like Sweden, which aims to eliminate the usage of paper money, this could become a natural mainstream payment method.

Stablecoins, also known as private digital currencies, are offered to the public with the claim of being a cost-free payment tool. Their continued viability as a payment tool will depend on whether their promised "par" features are truly sustainable.

*Rosen, J. (2024, November 11). Robot that watched surgery videos performs with skill of human doctor. J*ohns Hopkins University Hub.* https://hub.jhu.edu/2024/11/11/surgery-robots-trained-with-videos/

As TED University Economics Research Union, we thank Prof. Dr. Başçı for this special interview and his support in our works.

ECON DICTIONARY

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Economics 2nd Grade Student

Bubble

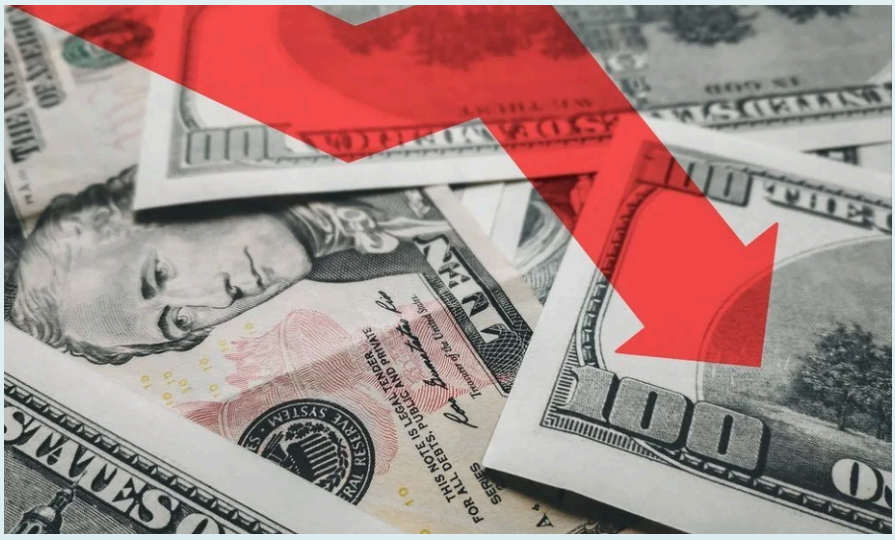
The concept that asset prices can rise far higher than can be justified by their fundamentals, such as the expected cash flows that will derive from them. Economists who believe in efficient markets are dubious that bubbles ever occur.

Convertibility

The ability of a country's currency to be freely exchanged for another country's currency in foreign exchange markets and to be used as a medium of exchange in international commercial transactions.

Deflator

A price index is used to convert an economic variable expressed in monetary (nominal) terms (such as wages, raw material prices, or costs) into its real value.



Devaluation

In a fixed exchange rate regime, it refers to a decrease in the value of the national currency against foreign currencies. For example, if the value of one Turkish lira against one U.S. dollar falls from 2.0 TL to 2.2 TL, it means that the Turkish lira has lost 10% of its value against the U.S. dollar (and the U.S. dollar has appreciated).

Equilibrium

Equilibrium in economics refers to the balance between supply and demand at a market-clearing price. It can apply to single markets or the entire economy (general equilibrium). However, equilibria may be unstable or not socially optimal. Some economists argue that too much focus is placed on this concept

ECON DICTIONARY

Financial Contagion

A situation in which international investors, disturbed by problems arising in one or several countries, rapidly withdraw their investments from other countries with similar characteristics, thereby spreading unfavorable financial conditions to other economies.

Import

It is the purchase of goods from other countries by individuals and institutions resident in a country.

Labor

A term used for both a factor for production and for the organized representatives of the working classes (trade unions and some political parties).

Velocity of Circulation

A measure of how quickly money changes hands. A key component in the formula at the heart of the quantity theory of money.

Speculation

Speculation differs from conventional investment primarily by its short-term nature, use of leverage, and lack of fundamental relationship to the speculator's interests. While often criticized, speculators play a vital role in financial markets by enabling businesses to hedge risks.

Money growth and Inflation in the 21st Century

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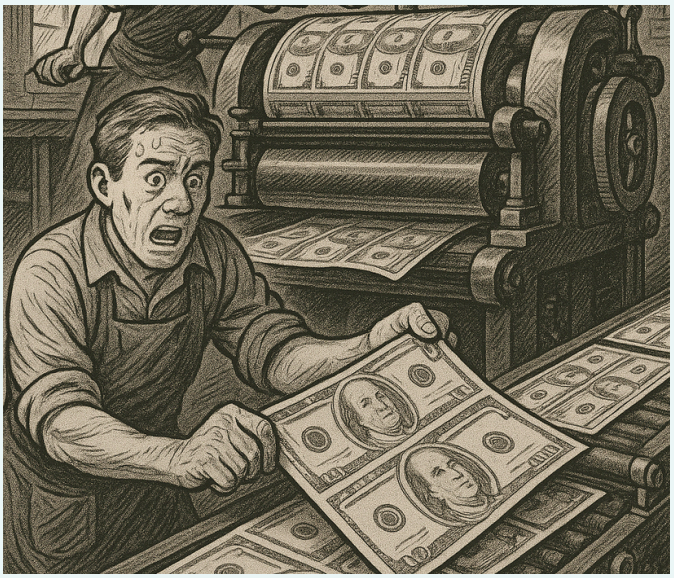
Economics Graduate Student

Inflation was in the past, and it will be in the future. It is one of the most crucial problems for economies throughout the world. Some economies, like Japan, strive to reach an inflation target to stimulate growth, while others, like Türkiye, aim to reduce inflation to preserve prosperity. Therefore, inflation has different points for economies. To analyze deeper, there should be drawn a frame for detailed relation between inflation and monetary policy tools, which are preferred by central banks to keep inflation stable. To struggle with inflation, many monetary tools are used, but some of them stand out, such as interest rates, money supply, interest corridors, and macroprudential policy tools like required reserve ratios. The relative importance of monetary tools varies country by country; generally, interest rate or policy rate is the first preferred tool by central banks. Whereas the failure of controlling inflation in some countries leads us think whether other monetary tools have a role in controlling inflation.

This question harbors different answers in history of economic thought; it's necessary to look at differences of approaches to money supply. According to David Ricardo, money supply is limited by golden reserves, and he accepts that money supply is exogenous, which means it can be controlled. In The General Theory (1936), J.M. Keynes argues that money supply is shaped by control of the central bank, while in A Treaties on Money (1933), Keynes states that money supply depends on demand of money by economic actors, especially for firms' finance motive. Hence, according to Keynes, money supply is exogenous in General Theory (1936) and it's endogenous in A Treaties on Money (1933). Schumpeter argues that money supply has important and considerable role to build strong economic development and highlights role of banks for credits (Festré and Nasica, 2009).

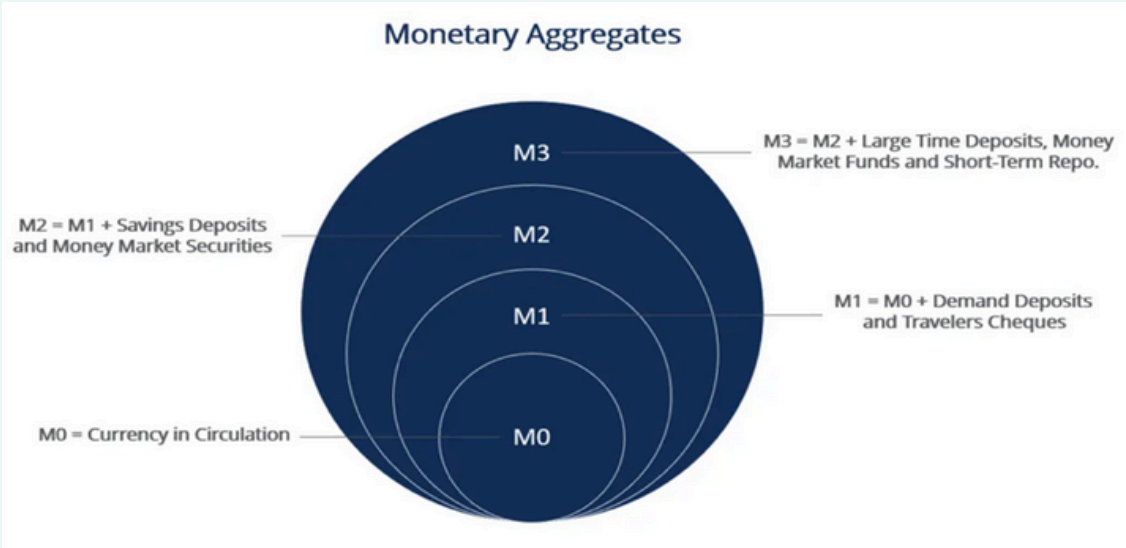


Milton Friedman answered this question by stating “inflation is always and everywhere a monetary phenomenon” within the concept of money supply and inflation by explaining the quantity theory of money. Friedman emphasizes the crucial role of money supply on inflation, and according to Friedman (1956), there is a strong relation between money growth and inflation as found in the formulation of quantity theory.

$$Quantity\ Theory\ of\ Money \rightarrow M.V = P.Y$$

M: Quantity of Money
V: Velocity (Circulation of money through economy)
P: Price Level
Y: Economic Growth

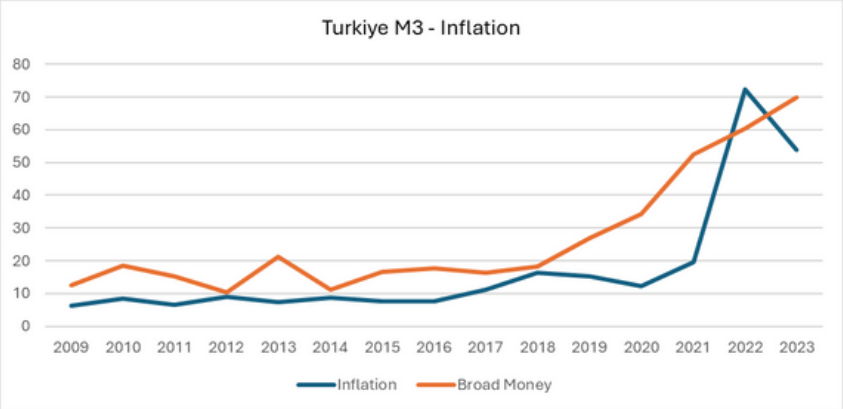
Modern empirical studies and definitions also confirm this classical link, and there exist four types of money supply: M0, M1, M2, and M3.



Source: https://corporatefinanceinstitute.com/resources/economics/money-supply

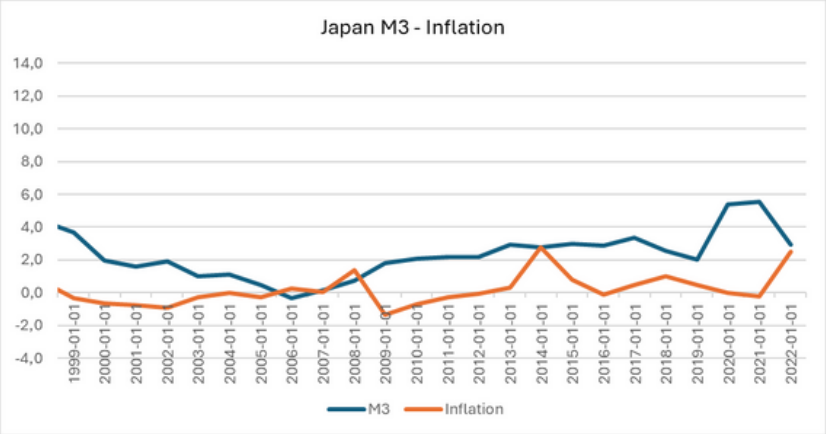
M3 is described as broad money, and even though the US prefers M2 and the UK prefers M4, most countries, including Türkiye, announce M3 to follow money supply to observe the effect of money supply on inflation in the last years. Borio et al. (2023) highlight that there is a strong link between money supply and inflation in recent years. To evaluate this relationship in Türkiye, which has had volatile inflation for the last 14 years, and in Japan, which has struggled with economic growth between 1981 and 2022, it is necessary to examine the graphs below.

Since the global financial crisis in 2007-2008, change in money supply and inflation have emerged a similar trend, and after post Covid-19 Pandemic in 2021, broad money demonstrated its effect on inflation after a one-year lag in Türkiye. That's why it's important to consider the effect of money supply on inflation in Türkiye, which is a developing economy, between the 2009 - 2023 period.



Data Source: World Bank

Unlikely from case of Türkiye, M3 trend of Japan is around 2 percent and trend of inflation is around 0 for period between 1999 and 2022, it is consistent with growth problem of Japan.



Data Source: FRED

Furthermore, macroprudential policies like the required reserve ratio or loan-to-income (LTI) have a kind of complementary role for monetary policy tools like money supply to strengthen financial stability and keep the financial system from possible shocks. Başçı (2023) states that the macroprudential policy dimension of monetary policy in its relation to inflation and the connection between macroprudential policy and money supply shouldn't be ignored.

Inflation remains quite a considerable point for economies to deal with the situation. Some economies, like Japan, see inflation as medicine to get rid of cases such as hypothermia and reach the ideal temperature, which is the economic growth target. Also, some economies, like Türkiye, see inflation as a high temperature and decrease it to an ideal level. Like in the medical field, treatment methods support each other; methods in monetary policies have a kind of similar role.

Monetary policy tools vary; however, generally interest rates or policy rates, money supply, and macroprudential policies are marked for central banks. Even though the discussion of money is endogenous or exogenous, it's obvious that the argument that money supply remains a crucial point to control inflation is valid. Borio et al. (2023) argue that there exist two regimes in inflation, a high regime and a low regime, and those reveal the question of whether there can be a threshold for money growth for G20 countries that satisfies whether money can be endogenous or exogenous or not. Moreover, Yılmazkuday (2012) emphasizes that point with the existence of more thresholds related to the inflation threshold.

Before conclusion, controlling inflation, for which money supply policies exist considerably, is not just an important point for price and financial stability and keeping the prosperity of the country. Following financial stability, it paves the way even for innovation and entrepreneurship based on creative destruction and sustainable economic growth. Aghion et al. (2009) highlight that stable inflation creates a predictable environment that supports productivity and entrepreneurship. Also, Professor Ufuk Akçiğit emphasizes the considerable effect of monetary policy and financial stability on creative destruction-based economic growth by preparing an appropriate economic environment. That's why holding inflation at a stable level provides predictability, retains prosperity, and following a suitable environment for firms and sustainable economic growth for economies in the long run.

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Technological Creativity and Creative Destruction: The Ideas Behind the Nobel Prize in Economics

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What are the essentials of economic growth?

Economists have debated for centuries whether the source of prosperity lies in capital, institutions, or technology. The 2025 Nobel Prize in Economics tries to provide an answer to this question: technological progress is at the heart of sustainable growth. In its decision announced on October 12, the Nobel Committee honored Joel Mokyr, Philippe Aghion, and Peter Howitt for their contributions to understanding how ideas, innovations, and knowledge transform economies. Joel Mokyr from Northwestern University received half of the prize for "defining the preconditions for sustainable growth through technological progress," while Philippe Aghion from the Collège de France and Peter Howitt from Brown University shared the other half for their "theory of sustainable growth through creative destruction."

However, behind these works lies the intellectual legacy of Joseph Schumpeter, the thinker who defined capitalism as a process of "creative destruction." The influence of Schumpeter's ideas is clearly felt in both Mokyr's historical analyses and Aghion-Howitt's mathematical models. Mokyr's recognition as an economic historian and the frequent awarding of Nobel Prizes to work in this field in recent years, according to many commentators, indicate that economic history is experiencing a new golden age on the Nobel stage.

So why were these people deemed worthy of the Nobel Prize? What did they discover, and what did they teach us?

Technological Creativity and Economic Progress: Joel Mokyr's "The Lever of Riches"

Joel Mokyr's main thesis is presented in his 1990 book, "The Lever of Riches: Technological Creativity and Economic Progress." This book is also his most cited work. He has written many other books that build on this thesis and further develop his theory. Another notable work is "The Gifts of Athena: Historical Origins of the Knowledge Economy." Mokyr has written many books on his subject, but since we want to focus on the main thesis that led to his Nobel Prize, this article will only discuss the findings in "The Lever of Riches."

Portrait of Joel Mokyr
Source: NobelPrize.org

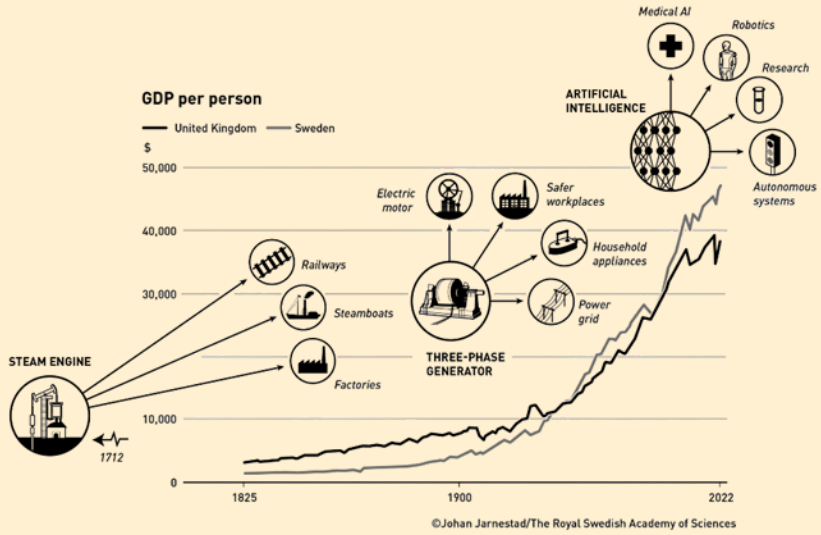
It would not be wrong to say that Mokyr is working on a topic like that of Daron Acemoğlu, who made our country proud by winning the Nobel Prize last year. Daron Acemoğlu was conducting research on why some countries are richer than others, and his conclusion was that institutions are formed differently in each country and lead to different outcomes. You can read more about this topic in the first issue of ERUMAG. Mokyr is essentially doing the same thing. According to Mokyr, the wealth gap between countries stems primarily from differences in technological development. If you have better technology, you are more likely to be wealthy. However, this raises several questions: why and how does technology make some countries wealthier, and why do some countries have more advanced technologies than others?

Mokyr challenges the frequently cited "there is no such thing as a free lunch" statement in classical economics. On the contrary, he argues that technological creativity can be a free lunch. If we can achieve the same output by spending less than the effort and cost required to produce it, then that is a free lunch. In terms that those who have taken an introductory economics course will better understand, technological development allows output to remain outside the production possibility frontier. This point, which would normally be impossible to reach with the available resources, has become achievable with the same resources thanks to technological development. Mokyr characterized this as a free lunch and criticized one of the most general assumptions of classical economics.

According to Mokyr, the best example of this is seen in the Schumpeterian growth model. This type of growth refers to an increase in efficiency through the application of knowledge to the production process in any way; this increase results either in the production of a certain output with fewer resources (i.e., lower costs) or in the production of better or completely new products. Furthermore, much of this growth stems from the deployment of pre-existing knowledge rather than the production of new knowledge. For Schumpeterian growth to continue, there must be complementarity between invention (new ideas) and innovation (application), and societies must be both inventive and innovative.

Aspirin is cited by Mokyr as a classic example of a ‘free lunch’ where large welfare gains are achieved at low cost. Aspirin was discovered in 1899 by Felix Hoffman (at Bayer). As an effective drug with no serious side effects and inexpensive to produce, it quickly became universally used. In other words, it was a product that did not require significant resources to produce but, thanks to the processing of knowledge, made a huge difference in human history.

Joel Mokyr divides inventions into two fundamental categories to explain the irregular and discontinuous nature of technological progress: macroinventions and microinventions. Macro-inventions are radical discoveries that represent a completely new idea with no clear precedent, almost as if created “out of nothing” (ab nihilo). Examples include the mechanical clock, the printing press, or the gravity-powered clock. These inventions often resist explanation in purely economic terms because they typically emerge as a result of genius, luck, or chance. Micro-inventions, on the other hand, are small, incremental steps that improve, adapt, and simplify existing techniques already in use (reducing cost, improving function, increasing durability, etc.).
Micro-inventions are far more numerous, and while most increase efficiency, they are more easily understood in terms of standard economic concepts (responding to prices and incentives). Mokyr argues that these two types of innovation are complementary and that, in the long term, radical innovations (macro-innovations) must be continuously developed (micro-innovations) to sustain technological creativity; without macro-innovations, continuous improvements encounter diminishing returns and progress eventually stalls.



Mokyr concludes that the biggest factor limiting technological progress is social forces that resist new ideas. Mokyr points out that resistance to technological progress comes from groups (monopolies, guilds, unions, and reactionary institutions) that possess capital specific to old technology (physical or human) and believe that change will reduce their prosperity. He argues that the basis of the West's success lies in exceptional circumstances where the normal social tendency for forces opposing technological change to be stronger than those supporting it can be overcome.
He also explains that technological progress is not generally Pareto superior (improvement for everyone affected), that there are losers in this process, and that it is usually easier for these losers to organize to stop change.

Mokyr put forward a historical thesis, but economics also draws on mathematical models. This is precisely where Aghion and Howitt come in.

From Mokyr's Historical Theory to Aghion-Howitt's Mathematical Model: Creative Destruction and Growth

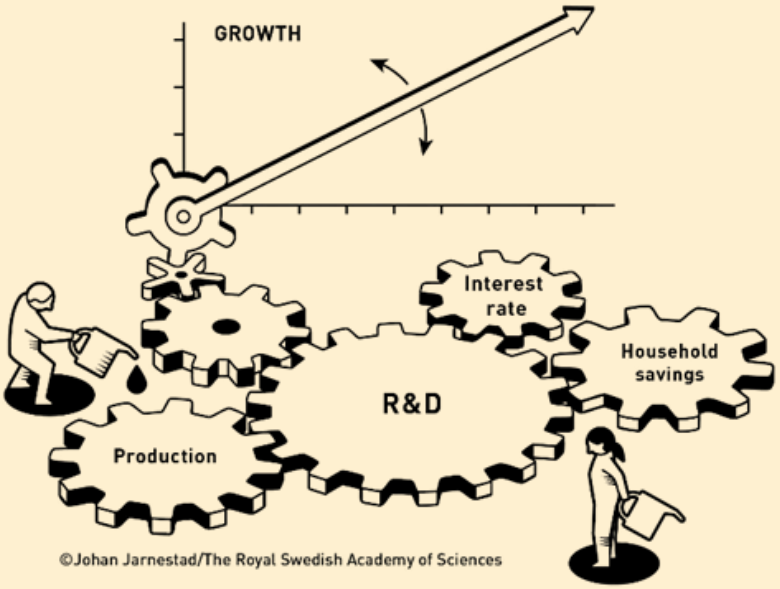
Aghion and Howitt actually indirectly complement Mokyr's work. While Mokyr approaches the impact of technological progress on growth from a more historical and verbal perspective, Aghion and Howitt succeeded in constructing a mathematical model of this phenomenon. The paper in which they announced this model, and which received the most citations, is “A model of growth through creative destruction.”

Philippe Aghion during lecture at the Collège de France
Source: NobelPrize.org

Aghion and Howitt's 1990 article is a theoretical model that places Schumpeter's idea of “creative destruction” at the center of economic growth. Schumpeter argues that the progress of capitalism involves a continuous cycle of renewal and destruction. As new ideas and technologies emerge, old ones lose their validity. This is both the source of economic development and the cause of instability. Aghion and Howitt take this idea and transform it into a mathematical model. According to them, a large part of economic growth stems not from capital accumulation but from technological innovation. Therefore, growth should be explained not by random “technology shocks” coming from outside but by the internal dynamics of the economy, namely people's decisions to innovate.

The model is based on the assumption that there are two types of activity in the economy. Individuals either work in production or engage in research and development to create new technologies. When research results in a new invention, production becomes more efficient, but this innovation renders old technologies obsolete. For example, digital cameras have replaced film cameras, and smartphones have replaced push-button phones. While every innovation brings gains, it also causes losses. The person or company that makes the innovation enjoys a monopoly for a short time and earns high profits, but this situation is not permanent. This is because the next innovation will also eliminate this company from competition.

Mathematically, the model explains this process through a type of probability mechanism. The emergence of innovations is random but depends on the amount of labor allocated to research. At any given moment, there is a probability that a new discovery will occur, and this probability is directly proportional to the labor allocated to research in the economy. This process is defined as the "Poisson process." In other words, more research creates a higher probability of innovation, but it is impossible to know exactly when innovation will occur. In the real world, this is similar to R&D activities carried out in laboratories. Scientists may work for years, but they cannot predict when a discovery will occur.



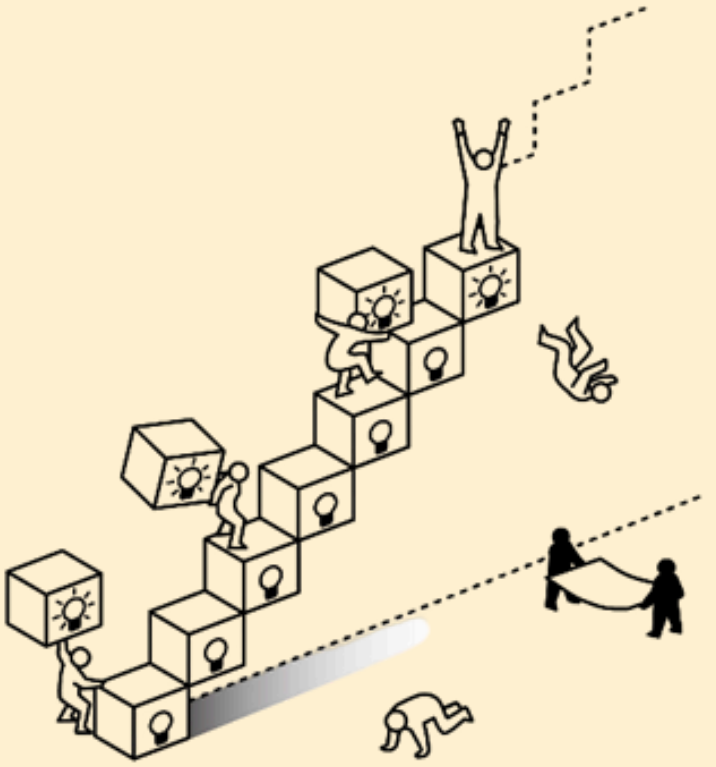
Every new invention increases the efficiency of the production tools used in the economy. Production costs decrease, and output increases. In the model, this situation is represented by the cost parameter in the production function decreasing by a certain rate with each innovation. Technological accumulation arises from past accumulation but also renders it obsolete. This is the process of "creative destruction" in its fullest sense.

The innovative company becomes the sole owner of the new technology through a patent and gains a short-term monopoly. This provides it with high profits. However, these profits are temporary, because the next innovation will render its technology obsolete. The more research is conducted in the economy, the shorter the lifespan of existing technologies becomes. In other words, innovation is a self-threatening process.

Equilibrium, or "balanced growth equilibrium," occurs when the labor allocated to production and research in the economy reaches a fixed ratio. In this case, the growth rate also stabilizes. According to the model, economic growth depends on two things: how often innovations occur and how powerful each innovation is. Therefore, growth is not a miraculous external factor, but an internal series of decisions.

This process is also random. Since the timing of innovations is unknown in advance, the economy's production level also increases in leaps and bounds. Authors describe this situation as “a random walk of log GNP.” In other words, production rises in the long term but carries uncertainty in the short term. In the real world, we can see this structure in the leaps created by the internet revolution in the 1990s, smartphones in the 2010s, or artificial intelligence in the 2020s. Every major innovation creates a random but lasting growth effect in the economy.

Portrait of Peter Howitt
Source: Ashley McCabe / Brown University



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The model also illustrates the difference between the private sector and social welfare. For a private firm, the value of an innovation depends on the duration of the profit it generates. However, the same innovation is more valuable from a societal perspective because it increases the productivity of the entire economy. This difference explains why private economies sometimes innovate excessively and sometimes innovate too little. If the “business-stealing” effect prevails, meaning companies engage in excessive innovation to steal each other's profits, there will be excessive growth. If knowledge externalities prevail, meaning the benefits of innovation spread to society and bring little gain to the individual, there will be little research.

Aghion and Howitt also discuss the effect of the magnitude of innovations on growth. If innovations are small, growth is slow. However, if innovations are very large, people become more cautious in their decisions about the future, because major technological leaps disrupt consumption and investment decisions. In this case, major innovations may reduce the desire for research. Thus, paradoxically, more revolutionary innovations can slow down the pace of growth.

What's Next?

In summary, both studies indicate that wealth and economic growth are possible through the processing of information and the discovery of new technologies. However, they also reveal that this process can have negative consequences, as new inventions can disrupt and eliminate older ones. This situation can also create significant resistance to innovation among the majority. For companies, innovation can also be an end in itself due to the profit derived from monopolizing new technology.

At the very moment these words are being written, the world stands on the brink of a new creative destruction. This creative destruction is none other than artificial intelligence. AI has the potential to grow our economies and increase our social welfare through the efficiency it provides. However, it also has the power to create new monopolies and, most importantly, to render existing technology, knowledge, and experience obsolete. We can say that this Nobel Prize awarded at this sharp turning point in history, also serves as a guide for us regarding the future.

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Press release. NobelPrize.org. Nobel Prize Outreach 2025. Sun. 19 Oct 2025.

The Dynamic Interaction Between Total Factor Productivity, Exports, and Economic Growth

Ömer Emre KOÇAK
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Sustainable economic growth relies on increasing capital and boosting productivity, especially Total Factor Productivity (TFP). Modern growth theory says that differences in income between countries are mainly about how well resources are used, not just how much they have. TFP reflects key aspects of an economy, such as knowledge, technology, institutions, and workforce quality.

However, increasing TFP alone is not enough. Productivity gains must lead to lasting growth by linking with global markets. At this point, exports are both a result of higher productivity and a driver of future growth.

1. The Effect of Total Factor Productivity on Exports: The Learning-by-Exporting Hypothesis

Empirical research on Kenya's manufacturing sector (Kimolo et al., 2024) argues a strong connection between export activity and firm-level productivity. The study finds that as export intensity increases, firms' TFP rises significantly, supporting the "learning-by-exporting" hypothesis.

In Kenya's case, exporters benefit from exposure to international competition, which stimulates process optimization and workforce skill development. Thus, exports act not only as a revenue source but also as a channel of knowledge and productivity transfer.

"Firms competing in foreign markets improve themselves in technology adaptation, quality standards, and management practices, thereby enhancing their total factor productivity."

As a result, TFP is both a determinant and outcome of export performance. Improving productivity strengthens competitiveness and enables companies to maintain their presence in global markets.

2. The Macro-Level Link Between TFP and Economic Growth

A large-scale panel analysis of middle-income countries (Le et al., 2024) clearly reveals the direct contribution of TFP to economic growth. According to the study, each increase in TFP enhances real growth rates by improving the efficient use of production factors.
Furthermore, the research highlights that TFP indirectly promotes growth through Foreign Direct Investment (FDI). Inflows of FDI facilitate the transfer of advanced technologies and management practices into domestic economies, but these benefits become permanent only in countries with sufficiently high TFP levels.

This finding sends a crucial message for policymakers:
"It is not enough to attract capital; the key is to build an economy capable of using that capital productively."

Le and co-authors show that the interaction between FDI and TFP positively amplifies growth, suggesting that productivity and investment are complementary forces. When combined with an active export sector, this complementarity forms the core engine of economic expansion.

3. The Role of Exports in Growth: Insights from Hausmann

In his theoretical essay Export-Led Growth, Hausmann (2024) investigates why income convergence across countries remains limited. He argues that the true driver of long-term growth lies in the quality and complexity of exports, not only their volume.
According to Hausmann, successful economies do not simply export more; they export more sophisticated and knowledge-intensive goods, thereby expanding their productive capabilities. This view fits closely with the concept of TFP, as an increase in TFP reflects a deeper accumulation of know-how and technological capacity within the production system.
Hausmann's idea of "economic complexity" can be interpreted as the macro-level expression of productivity. Micro-level learning-by-exporting processes scale up into macro-level export-led growth dynamics. The success of this transition depends on an economy's ability to accumulate knowledge and leap into new sectors.

4. A Holistic Perspective: From Productivity to Growth

When the three studies are considered together, a comprehensive mechanism emerges:

1. TFP growth enhances production efficiency and firm competitiveness.
2. Rising productivity enables firms to expand into foreign markets.
3. Export experience generates feedback effects, bringing new knowledge and technology that further increase TFP.
4. Elevated TFP and export performance together sustain long-term economic growth.

This self-reinforcing cycle represents a virtuous cycle of development. Yet, its success depends on complementary factors such as education, institutional quality, infrastructure, access to finance, and an innovation ecosystem.

5. Policy Implications

- Investment in Education and Skills: Human capital is the foundation of productivity growth.
- Export Promotion Policies: Financial support and consultancy programs should facilitate SME participation in global markets.
- R&D and Technology Transfer: University–industry collaborations and technology hubs can strengthen the institutional base of TFP.
- Sectoral Diversification: As Hausmann suggests, shifting production toward knowledge-intensive industries supports both productivity and growth in the long run.
- Quality of Investment: FDI should target sectors that generate technology spillovers and enhance domestic productive capacity.

Conclusion

Total Factor Productivity is not only an indicator of production efficiency, it also represents a nation's capacity to learn, innovate, and institutionalize knowledge. Exports, in turn, test and expand this capacity in the global arena, creating continuous renewal and adaptation.

As shown by Le et al. (2024), the interaction between TFP and investment forms the core of economic growth; Kimolo et al. (2024) illustrate how this mechanism operates at the firm level; and Hausmann (2024) provides the theoretical foundation for its necessity in development. Finally, the connection between productivity, exports, and growth is not linear but cyclical and mutually reinforcing. The nations that support this cycle, rather than breaking it, will be the ones to achieve enduring prosperity.

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As the TEDU Economics Research Union, we'd like to thank Ömer Emre KOÇAK and the TEDU Economics and Finance Society for their contribution to the ERUMAG.

DOES AI BOOST LABOR PRODUCTIVITY?

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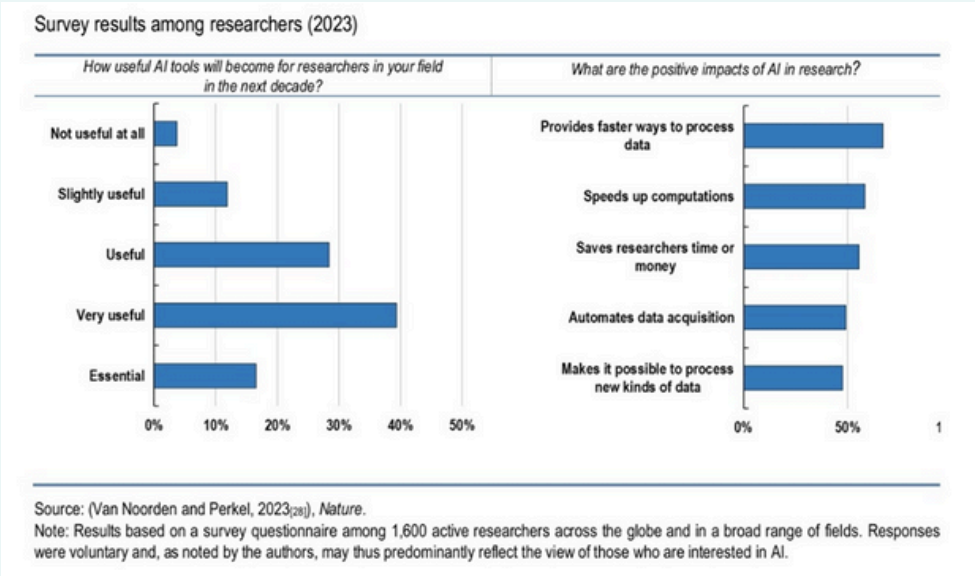
Since the forthcoming of AI, this question has been asked several times. Various research has been conducted, and the answers are divided into two. One side of research shows that AI does contribute to labor productivity, while the other side states that it has damaging effects.

Firstly, we should pay attention to the fact that AI has no agreed-upon definition and that there is a need for more firm-level data. The data that is available has a high probability of indicating short-run results (Damioli et al., 2021 & OECD, 2024). Despite these, we can observe that AI is capable of improving productivity in several ways, some of which are seen to be the creation of modern technologies, the capability of interchanging already in-use technologies, and further strengthening predictions.

Some key areas where AI is particularly utilized for productivity are project management, human resources, customer services, data analysis, and research. The reason why AI increases productivity is because it reduces time spent on tasks through automation of monotonous pieces of work, lowers error rates, which enhances results, and increases personalization (IBM, 2025). In a study carried out in Taiwan, firms that have attained AI patents are linked to a nearly 13% increase in productivity in contrast to firms that have not attained any AI patents (Yang, 2022).



(From: OECD, 2024)

Going on with those who foresee a negative impact on labor productivity, we can first consult the work of Acemoğlu (2021). He has devised some theories about the potential effects of AI and points out that what is important is in which ways AI is being preferred to use. In the case that AI is utilized for putting forth tasks that were not previously present, then this could have potentially positive outcomes.

One example of this is the improvement of teacher productivity by integrating AI into classroom environments and using it for generating original tasks. On the other hand, if AI is being utilized for tasks that humans can already perform without much external help, then this could produce negative outcomes due to over-automation. Over-automation in this frame is defined as when the speed of automation exceeds the socially beneficial rate of automation. Over-automation has the potential to misuse resources, oust labor, and also bring forth inefficiencies, therefore lowering productivity.

When we go back to Damioli et al.'s work, they have found a 3% increase in productivity when a firm has twice the amount of AI patents they used to have (2021). However, according to Syverson (2017), we see a contradicting example from the US.

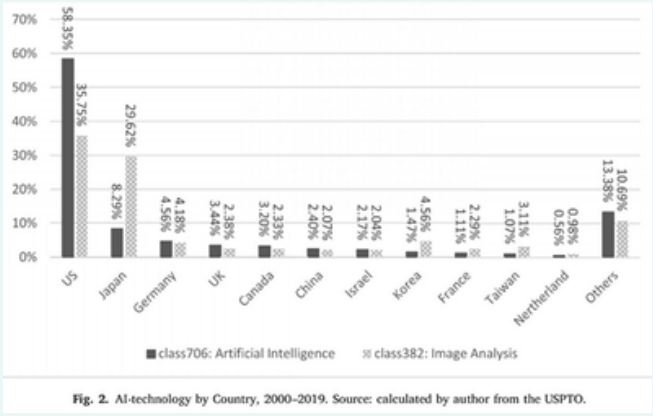
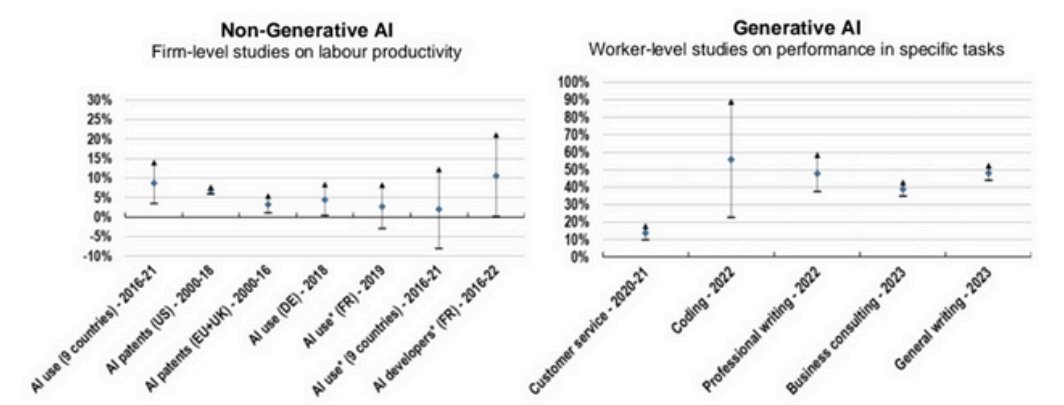


Fig. 2. AI-technology by Country, 2000–2019. Source: calculated by author from the USPTO.

(From: Yang, 2022. We can see that despite the US having the most AI technology, the average labor productivity rate has dropped.)

Between the years 1995 and 2004, the average labor productivity rate was 2.8%, but between 2005 and 2015 a drop of 1.5% occurred reducing the average labor productivity rate to 1.3%.

We can continue to try to answer our question by inspecting OECD's Artificial Intelligence Papers of April 2024. Despite the lack of empirical evidence, there are some initial micro-level data stating that mainly fast embracers of the most recent AI have considerable productivity returns. One detail we can mention is that when workers with fewer competencies and workers with more competencies are compared, those with more competencies have a weaker response to AI, whereas workers with fewer competencies display a stronger response to AI, increasing their overall productivity significantly. Another finding is that a worker performance enhancement of between 10% and 56% has been observed in certain assignments, particularly those related to writing, customer service, and software development. Besides this productivity outcome, the studies also indicate increased physical and mental well-being, together with a rise in job-related happiness.



Note: *controlling for other ICT technologies. In the left panel, "AI use" is a 0-1 dummy obtained by firm surveys, while AI patents refers either to a 0-1 dummy for having at least 1 patent (US study) or to the number of patents in firms (for the EU+UK study, where the average number is 0.48 with 2.6 standard deviation, so that firms cumulating more than one patents are relatively few). Two of the estimates in the panel ("9 countries, 2016-21") relate to the same study (Calvino and Fontanelli, 2023[45]), but the second estimate controls for other ICT technology use and thus better isolates the marginal impact of AI. Given that the study reports separate estimates for all 9 countries, the median estimate across countries is shown on the Figure.

(Source: OECD, 2024)

In conclusion, we can see that AI has the potential to create both positive and negative outcomes on labor productivity through different paths, and that we still need time to better comprehend its implications. In the meantime, we can try our best to use AI in the most responsible way, without endangering our overall well-being.

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The Debt Spiral of the Ottoman Empire: Foreign Capital and Loss of Economic Independence

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Economics 4th Grade Student

Türkiye's economic history has always fascinated me. I find it particularly valuable to examine and understand why and how decisions were made under difficult circumstances. In this article, I discuss my thoughts on the Ottoman Empire's experience with foreign capital in the 19th century by reviewing two pieces: Korkut Boratav's Türkiye İktisat Tarihi (2015) and Ayça Tekin-Koru's "Yüzyılın Yabancı Sermaye Öyküsü" (2023). Reading and discussing the writings of Boratav and Tekin-Koru has also given me a unique perspective on this process.

Peace Rumors by Thomas Nast
(Harper's Weekly, 30 June 1877)

In my opinion, in order to understand the economic situation of the Ottoman Empire in the 19th century, it is first necessary to understand what foreign capital means. For the Ottoman Empire, borrowing from the international market initially seemed like an easy and practical solution, and it may have been thought that foreign powers were investing in the country with the aim of helping it. However, it gradually led to the Ottoman Empire losing its economic independence. Boratav argues that, the Ottoman economy lacked the strength to sustain itself in the 19th century, leading to the dominance of foreign capital through foreign borrowing and direct foreign investment. As Tekin-Koru notes, the economy during this period was largely shaped by foreign capital inflows.

This process, which began in 1854 to finance the Crimean War, as Boratav explains, led to dependence on foreign capital rather than strengthening the empire's own economy. This borrowing led to a financially dependent structure rather than increasing production and development. This borrowing was not only a financial step but also a step that eroded Ottoman sovereignty and independence.

As a result of the state's financial inadequacies, it did not settle for material borrowing, also foreign investments also intensified in areas such as railways, banking, and insurance. As Tekin-Koru highlights, the area where foreign capital was most concentrated was railways. While facilitating economic revival and trade on the one hand, extensive privileges were granted to foreign companies on the other. The Ottoman Empire was unable to gather its strength and take control of the system. If we could have used the aid we received from abroad to build our own railway network, this process would have been more positive for us. Unfortunately, Europe realized the strategic importance of railways before we did. While goods could be easily transported from Europe to Istanbul, the Ottoman Empire experienced serious disruptions in its own internal delivery and transportation processes. bu süreçte Unfortunately, by aiming for development through the high-road, we have signed up for a superficial modernization, which has left us one step behind other countries.

As the Ottoman Empire borrowed more, it became increasingly dependent; similarly, as debt payments increased, it was forced to borrow again. This This debt spiral continued. It tried to cover its debts with more debt. According to Boratav, the Düyun-u Umumiye, established in 1881, was created to ensure that debts were paid off in a planned manner. This institution was not only a debt collection agency but also a guarantee mechanism for foreign investors. It ensured that Europe would guarantee that the Ottoman Empire could borrow from abroad and repay its debts. However, it was not as innocent as it seemed. It placed the Ottoman finances under the control of European creditors. It transferred certain taxes collected in the Ottoman Empire directly to European creditors. It took away the empire’s power to control its own money.

From an optimistic perspective, investments made in the Ottoman Empire demonstrate the support foreign powers provided for the country's development. It seems that external powers supported us in our development and progress. Unfortunately, from a more realistic perspective, it reveals that the empire’s independence was undermined and the Ottoman territories were economically divided. The freedoms granted in exchange for loans and investments enabled Europe to control the economy and undermine the independence of the Ottoman Empire.

I believe that Turkish youth need to learn more about the events that have had such a profound impact on our history. In the history lessons we took for years, I wanted to learn about world history and its impact on Türkiye. When looking at a picture, I wanted to see the whole picture, not just one point. This cannot be achieved by knowing only Turkish history. More detailed world history lessons and Türkiye's decisions during those periods help us make more comprehensive analyses. Learning our history not only through wars and facts but also through cause-and-effect relationships and connections makes it more memorable and allows us to learn about the past better and be more curious about it.

Reading these in-depth studies always helps me understand much better why learning history is so important. It helps us analyze why certain decisions were made during specific periods. It not only helps us understand the past, but also shapes the decisions we make today. My thoughts before and after this research are definitely different. The process of economic dependence shows that if we want to experience real development and progress, we must maximize our own capabilities and prioritize our independence in all areas. We can take examples from outside, but we should not be dependent on the outside. For real progress, we must courageously chart our own course rather than copying the path of others.

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Economics of AI with Prof. Dr. Altuğ Yalçıntaş

Arda AKGÜL
Economics/BA 3rd Grade Student

The "FieldTalks" podcast series, prepared in collaboration with the TED University Economics Research Union (TED Üniversitesi Ekonomik Araştırmalar Birliği) and broadcast on RadioTEDU, presented Prof. Dr. Altuğ Yalçıntaş discussing the economics of AI. Prof. Dr. Yalçıntaş is an academician working in the Political Economy department at Ankara University, where he also teaches the Economics of AI course.

Prof. Dr. Yalçıntaş is an economist who completed his doctorate in economics, focusing on complexity economics. Since 2013, he has been researching the social media economy, including the profitability of social media companies, the manipulations they cause, and the operation of the system referred to as surveillance capitalism. His current work focuses on the societal and economic consequences of artificial intelligence.

Dr. Yalçıntaş notes that artificial intelligence (AI), in its broadest sense, refers to machines that mimic natural intelligence.

youtube.com/@TEDUERU
instagram.com/erutedu

These systems primarily learn by reading the entirety of open-source material available on the internet. They operate through models, often called Large Language Models (LLMs), which respond to user prompts. While AI can produce professional and technically accurate answers, a positive aspect that Dr. Yalçıntaş finds amazing, it inherently possesses the negative biases present in the language it is trained on, such as discrimination, racism, and sexism, which are embedded within the language itself.

The Economic Scope of Artificial Intelligence

Any sector that deals with data, directly or indirectly, is highly eligible to using AI technologies. Data production is, however, continuous; people generate data every second through mobile devices and computers, even when they are not actively using their devices, such as browsing Amazon but not making a purchase. AI tools are common in communications, IT, R&D expenditures, coding, legal consultancy, and even mental counseling, although they are not used in every sector, such as construction. AI tools aim to increase efficiency and productivity. They are especially common in creative sectors, used for tasks like text creation, image recognition, translation, music production, design, and data visualization or cleaning.

Dr. Yalçıntaş, who also makes music, mentions that he uses AI tools like Suno, AIVA, and Scaler to generate chord structures. He uses AI, in his being independent musician capacity, to assist in finding specific words when blocked during songwriting.

Dr. Yalçıntaş applies AI to his own academic work too, currently managing a research project using AI to analyze the history of economic thought texts from the Ottoman Empire and the Turkish Republic, aiming to compile an encyclopedia covering the last 200 years. This project involves digitizing or analyzing existing digital texts, using a publicly available custom GPT trained on Ottoman Turkish texts.

Ezgi Eylem Erdoğan, Prof. Dr. Yalçıntaş and Arda Akgül after the podcast.

AI and the Labor Market

The question of whether AI will take people's jobs is a common and valid concern, but it is currently an abstract one. While AI may disropt some roles, like some software developers or translators, it is not expected to affect jobs like childcare or academic historians who do not utilize AI. The process of "creative destruction" means that while AI removes certain jobs, it simultaneously necessitates new jobs and skills. Historically, new technologies, like the steam engine during the First Industrial Revolution, have not caused structural unemployment, though they often worsened working conditions and created social issues.

The lack of current macro-level data makes it difficult to definitively measure job losses caused by AI, although layoffs have occurred in sectors like IT, indicating micro-level issues. Dr. Yalçıntaş also notes that if institutions (like universities) fail to adapt their curricula quickly, this lack of new skills among recent graduates could be contributing to the issue of youth unemployment, which existed even before the popularization of AI tools.

Adaptation and the Speed of Technological Change

The current era featuring AI represents the Fourth Industrial Revolution. Unlike the first Industrial Revolution, where the steam engine was slow to gain access, AI tools spread rapidly and widely upon release. Academics and professionals must adopt a "learning by doing" approach, as the production speed of academic articles cannot keep pace with AI developments. Academic articles, which can take years to publish, often present arguments that become invalid upon publication because the underlying technology, such as Spotify's algorithm, has changed.

Individuals who avoid using AI tools in fields such as communication, coding, legal consulting or creative fields are at risk of job loss or reduced salary. If employees fail to take advantage of these tools to increase productivity, employers may choose to maintain the same output with fewer workers, thereby reducing total labor costs.

Therefore, it is important to be prepared to use AI as the technology advances autonomously.

Türkiye's Position and Technological Dependency

Türkiye holds a comparatively strong position in digitalization, having successful projects like Ekşi Sözlük, e-Devlet, and DergiPark, which allows academic journals to manage publishing processes openly and freely. Other successes include the defense sector (Baykar), the automotive sector (TOGG), the developed retail sector, and the highly successful gaming sector, where Türkiye ranks second globally. A key positive factor is the presence of many entrepreneurs and public administrators who are curious about and knowledgeable regarding AI.

However, the common use of digital technologies, especially platforms controlled by large foreign monopolies, creates extreme dependence. Dr. Yalçıntaş suggests that in a scenario where a large company like Alphabet (Google, YouTube, Gmail) suddenly severed services to Türkiye due to political difficulty or disaster, essential services, including financial transfers and even bread production, could be immediately compromised.

The Rise of Nation-Corporations and the Crisis of Governance

Prof. Dr. Yalçıntaş argues that capitalism is changing. Global tech companies like Alphabet, Meta, Apple, and Microsoft should be seen as "nation-corporations," possessing market valuations greater than the GDP of some nations. These entities possess characteristics of a state:

- They have their own "constitutions" (terms and conditions).
- They have vast populations of "citizens" (Netizens), often numbering billions, far exceeding the number of their actual employees.
- They use propaganda and manipulation, similar to states.

Users who rely on services like Gmail or WhatsApp are providing "free labor" (unpaid labor). Prof. Dr. Yalçıntaş suggests a political movement demanding payment for contributions, such as receiving payment for every Google search, as users are contributing to the platform's value creation. When tech monopolies face legal sanctions (e.g., fines from the European Union), the penalties are often minor compared to the company's daily profits, which may incentivize continued misconduct.

Digital and Mental Resilience

The pervasive nature of digital technology also carries significant social costs, including environmental impacts (unexplored in the discussion) and negative externalizations. Crucially, these technologies contribute to mental health issues like anxiety, depression, and loneliness. Individuals must prioritize their mental well-being in the face of these tools.

Prof. Dr. Yalçıntaş advises students and professionals to pursue non-traditional skills (like Python, R, SQL, and data visualization) beyond what conventional universities might provide. Given the possibility of digital catastrophe (due to war, energy crisis, or corporate failure), which could wipe out intangible digital records of culture and knowledge, institutions must be prepared to transform.

As a policy suggestion for Türkiye, Dr. Yalçıntaş proposes an "Offline Drill." This national exercise would involve temporarily shutting down the internet (for instance, for one day) to measure the country's level of dependency, identify vulnerabilities in core systems (like financial transfers or government payroll), and develop contingency plans for maintaining daily functions.

Conclusion for Youth and Professionals

In this rapidly transforming environment, being an entrepreneur and using one's social intelligence are becoming mandatory. It is vital to cultivate creativity and the freedom to "talk nonsense" systematically, as innovation often arises from unconventional ideas.

This rapid technological shift, where information and services are managed by a few global corporations, is like relying on a single, massive global reservoir for all your water needs. While the water (data/services) is clean, fast, and seemingly free, if that one reservoir breaks, gets politically choked, or decides to charge exorbitant fees, your entire city, from the hospitals to the bakeries, runs dry instantly because no local backup systems were maintained.

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ERU NEWS

Pelin PAYALI
Business Administrations
2nd Grade Student

Yusuf Arda ARSLANOĞLU
Economics 2nd Grade Student

Weak Point: Rare Elements

The U.S. has announced a 100% tariff on Chinese goods if trade talks fail. China has responded with export control on rare elements and critical minerals, which are critical for battery and high-tech processor production. The U.S. side views these controls as economic coercion, arguing they disrupt global supply chains and threaten global tech competitiveness.

(The White House)

Chia, O. (2025, October 17). China has found Trump's pain point - rare earths. https://www.bbc.com/news/articles/ckg1jr18z4ko

The Turkish Central Bank Cuts the Policy Rate to 39.5%

On October 23, 2025, the Central Bank of Republic of Turkey (CBRT) decided to lower its policy rate by 100 basis points, bringing it down from 40.5% to 39.5%. CBRT also changed overnight landing and borrowing rates, cutting them to 42.5% and 38%. CBRT noted that the underlying inflation trend strengthened in September. This is the Central Bank's third consecutive interest rate cut, following a series of aggressive rate cuts earlier this year.

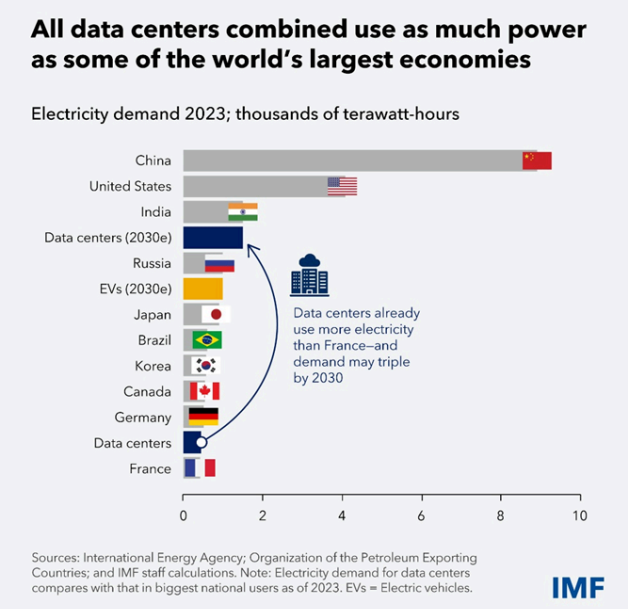
(AA)

TCMB - Summary of the Monetary Policy Committee Meeting (2025-57). (n.d.). https://www.tcmb.gov.tr/wps/wcm/connect/EN/TCMB+EN/Main+Menu/Announcements/Press+Releases/2025/ANO2025-57

ERU NEWS

Environmental Cost of AI

Global data centers consumed about 500 TWh of electricity in 2023, more than double 2015–2019 levels, according to OPEC. The organization expects usage to triple to 1,500 TWh by 2030 as AI growth accelerates. The IMF predicts that AI could boost global GDP by 0.5% annually between 2025 and 2030, saying the economic gains will outweigh rising energy costs and emissions. "Despite higher electricity prices and greenhouse gas emissions, the gains to global GDP from AI are likely to exceed the cost of additional emissions," the IMF said.



(IMF)

Green, A., Tai, H., Noffsinger, J., & Sachdeva, P. (2024, September 17). How data centers and the energy sector can sate AI's hunger for power. McKinsey & Company. https://www.mckinsey.com/industries/private-capital/our-%20insights/how-data-centers-and-the-energy-sector-can-sate-ais-hunger-for-power

AI needs more abundant power supplies to keep driving economic growth. (2025, May 13). IMF. https://www.imf.org/en/blogs/articles/2025/05/13/ai-needs-more-abundant-power-supplies-to-keep-driving-economic-growth

FED cuts interest rates

The U.S. Federal Reserve lowered interest rates to 3.75-4.00% on October 29, 2025; this was the second rate cut of the year, aiming to support a slowing job market. However, Chair Jerome Powell said further cuts are not guaranteed, citing persistent inflation and missing data caused by a government shutdown.

(FED)

Mena, B., Buchwald, E., Towfighi, J., & Egan, M. (2025, October 29). Federal Reserve cuts rates to lowest level in three years. CNN. https://edition.cnn.com/business/live-news/federal-reserve-interest-rate-10-29-25

ERU NEWS

ECB head Christine Lagarde warned

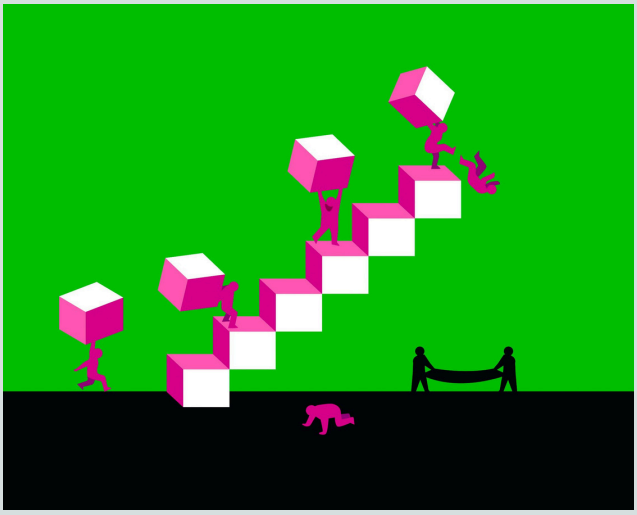
European Central Bank (ECB) president Christine Lagarde warned that the global economy hasn't felt the impact of new US tariffs, which exporters and importers have absorbed for now. She also emphasized that technology development and trade policies are influencing the global economic balances. Tariffs, especially between large economies like the US and the EU can have a direct impact on global growth, supply chains, inflation, and investment decisions.

(ECB)

Donnan, S., & Wiedemann, K. (2025, October 19). Global economy gets another jolt of uncertainty as Trump tariffs loom. Politico. https://www.politico.com/news/2025/10/19/global-economy-trump-tariffs-ecb-lagarde-00615067

2025 Nobel Prize in Economics

Three economists, Joel Mokyr, Philippe Aghion, and Peter Howitt have been awarded the 2025 Nobel Prize in Economics for advancing our understanding of how technological innovation and creative destruction drive long-term economic growth, the Royal Swedish Academy of Sciences announced on Monday. According to The Guardian and Reuters, this year's award highlights the growing importance of AI, digital transformation, and innovation policy in shaping global economies amid technological disruption.



(NobelPrize.org)

Sveriges Riksbank Prize in Economic Sciences In Memory of Alfred Nobel 2025. (n.d.). NobelPrize.org. https://www.nobelprize.org/prizes/economic-sciences/2025/summary/

ERU Recommends

Ezgi Eylem ERDOĞAN
Economics 3rd Grade Student

Wall-E (2008)

A robot who is responsible for cleaning a waste-covered Earth meets another robot and falls in love with her. Together, they set out on a journey that will alter the fate of mankind (IMDb).

Director
- Andrew Stanton

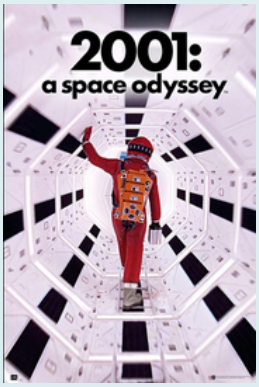
Writers
- Andrew Stanton
- Pete Docter
- Jim Reardon

2001: A Space Odyssey (1968)

When a mysterious artifact is uncovered on the Moon, a spacecraft manned by two humans and one supercomputer is sent to Jupiter to find its origins.

Director
- Stanley Kubrick

Writers
- Stanley Kubrick
- Arthur C. Clarke



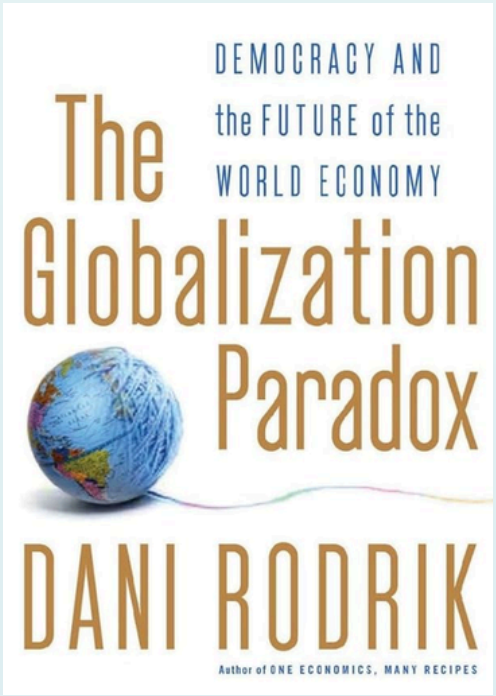
Music & Podcast

ERU Recommends

Ezgi Eylem ERDOĞAN
Economics 3rd Grade Student

The Globalization Paradox - Dani Rodrik

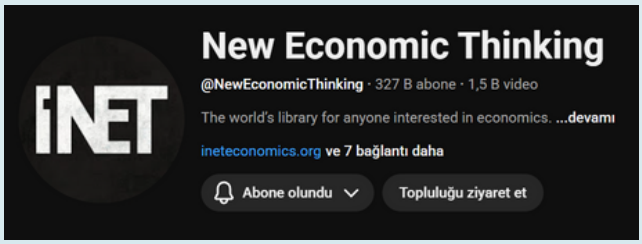
"The Globalization Paradox" by Dani Rodrik explains why we cannot have complete economic globalization, national sovereignty, and democracy all at once. Rodrik argues for a balanced approach to globalization that protects democracy and national interests while still participating in the global economy.



Rodrik, Dani. (2011). The globalization paradox : why global markets, states, and democracy can't coexist. Oxford ; New York :Oxford University Press,

New Economic Thinking

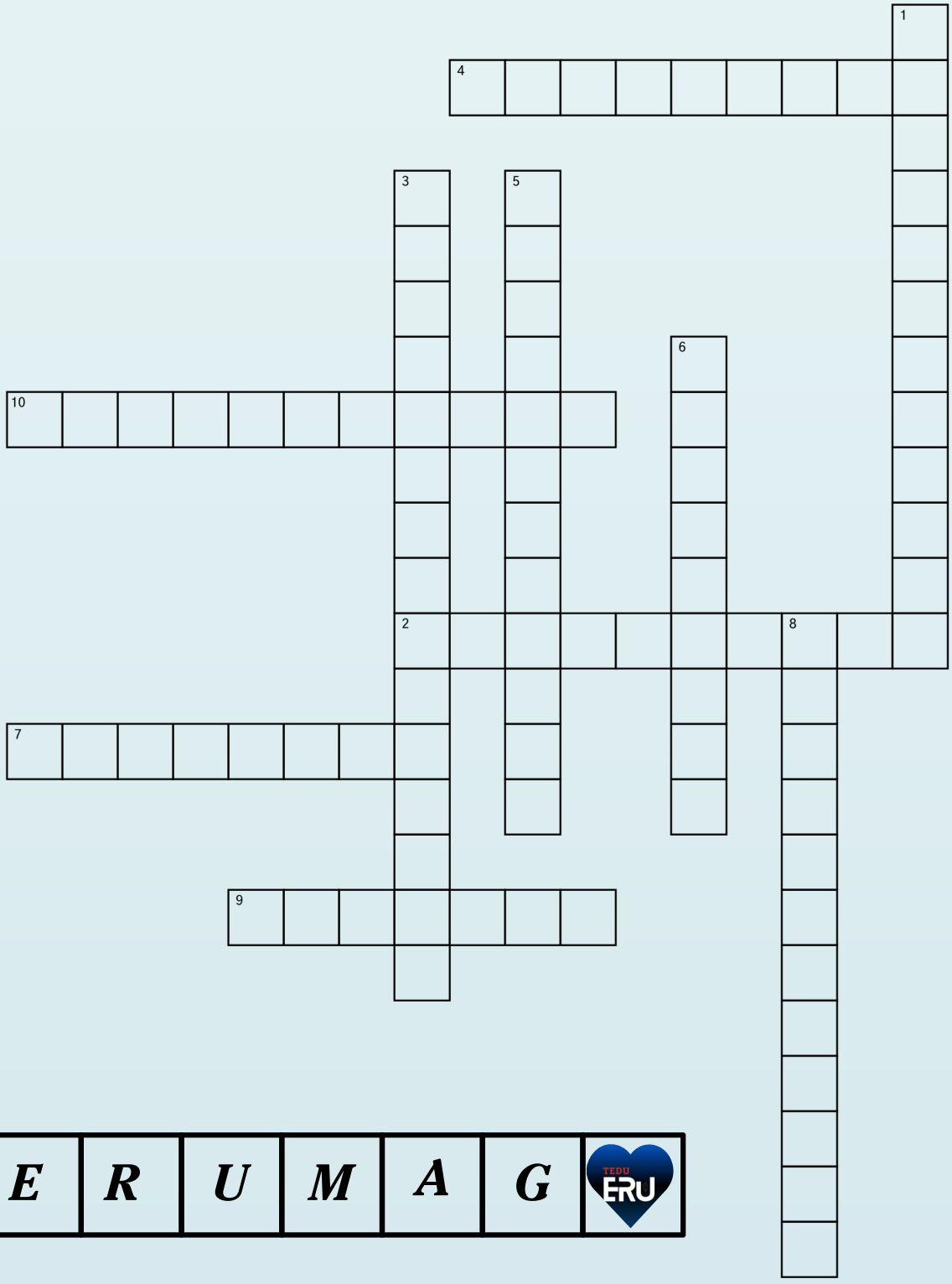
The YouTube channel “New Economic Thinking” offers engaging and accessible videos featuring interviews with leading economists, discussions on current economic challenges, and fresh perspectives about the field of economy.



The channel includes video series that explore economics from diverse angles. By hosting renowned economists in their programs, you can discover different worlds within the economic universe and learn new things.

ECON CROSSWORD

Defne TOKDEMİR
Economics 2nd Grade Student



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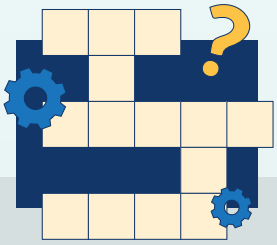

ECON CROSSWORD

Down

1.The situation in which people who are willing and able to work cannot find jobs.
3.The value of the next best alternative that must be given up when making a choice.
5.The measure of output produced per unit of input, such as labor or capital.
6.A decrease in the general price level, often linked to reduced consumer demand.
8.The value of one currency expressed in terms of another.

Across

3. Spending on capital goods to increase future production and growth
6. A period of significant decline in economic activity across the economy..
7. The basic economic problem of limited resources and unlimited wants.
9. A financial support provided by the government to encourage production or consumption.
10. The point where supply and demand are balanced in a market.

ANSWERS

DOWN
1. UNEMPLOYMENTN
3.OPPORTUNITY COST
5.PRODUCTIVITY
6.DEFLATION
8.EXCHANGE RATE

ACROSS
2.INVESTMENT
4.RECESSION
7.SCARCITY
9.SUBSIDY
10.EQUILIBRIUM

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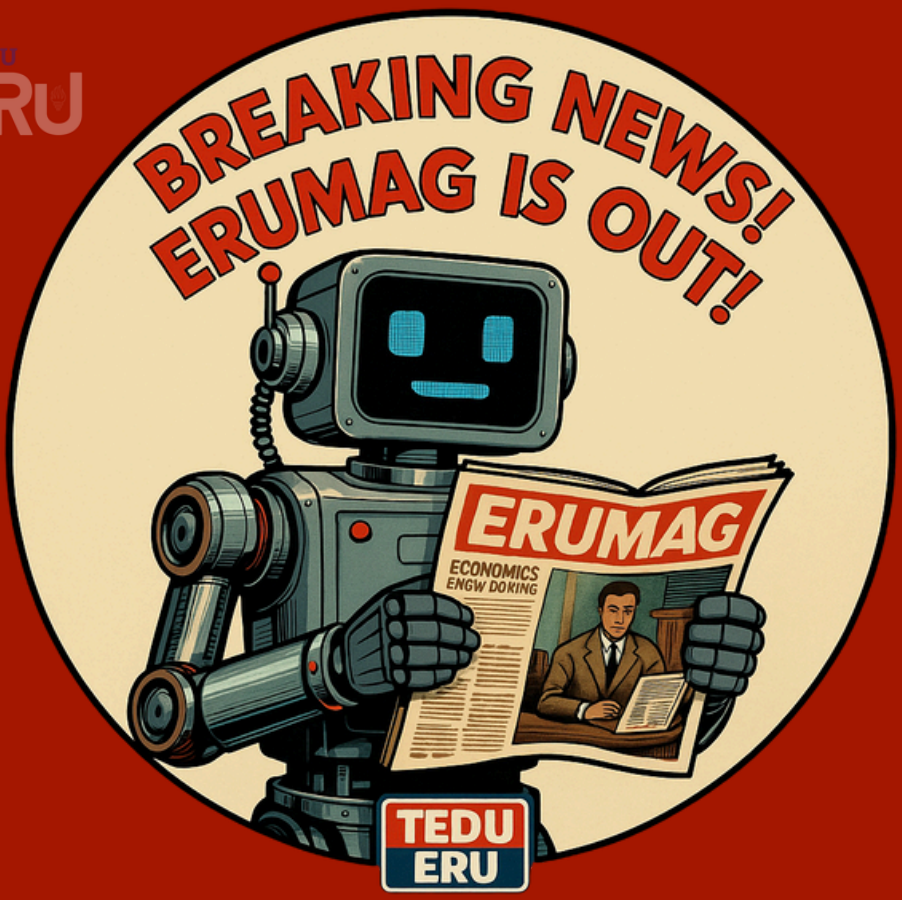
End.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TEDU Economics Research Union

November 2025, Issue: 3

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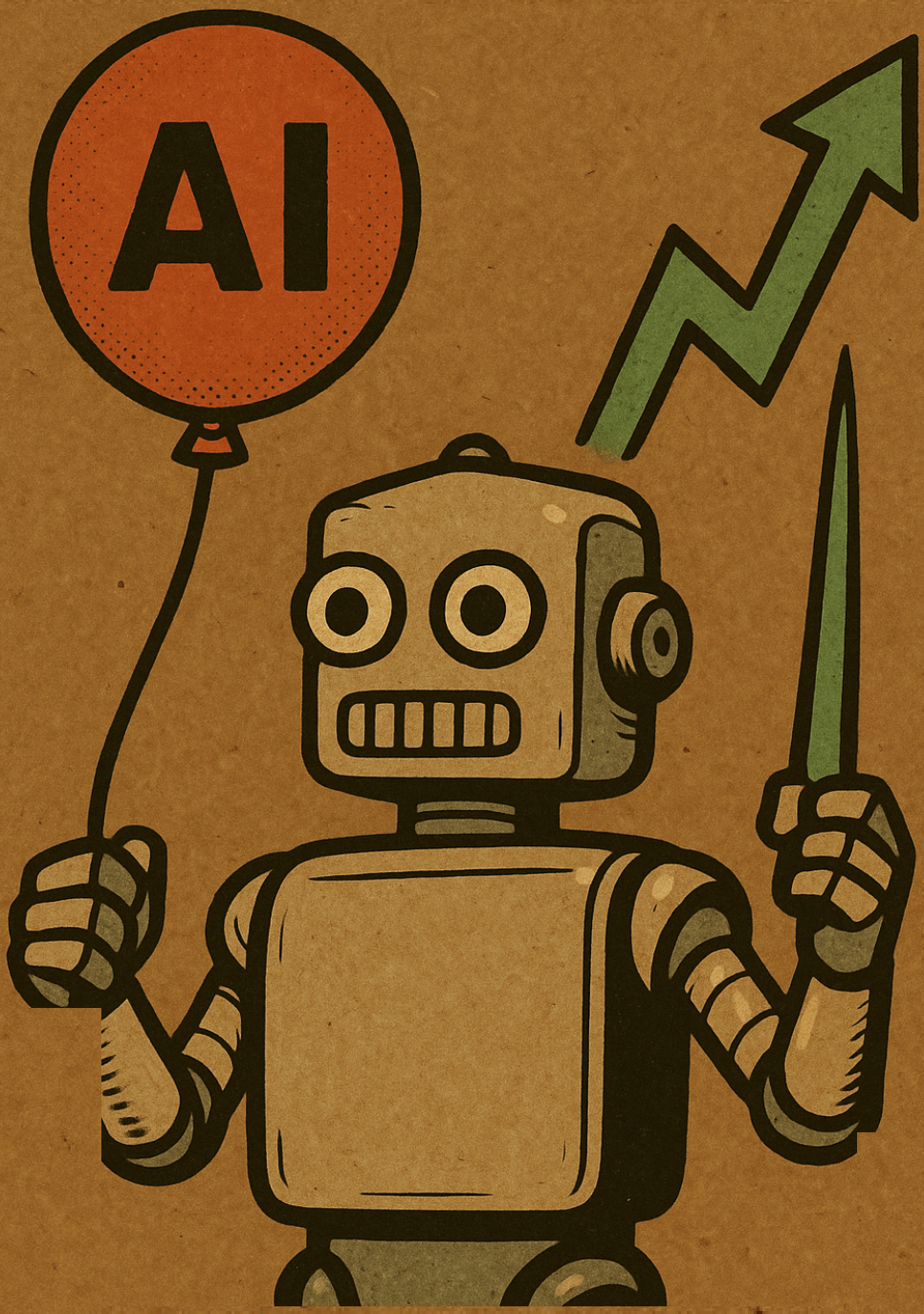

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