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Transformation

The new wave: Agentic AI

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Key takeaways

- New and disruptive AI capabilities are emerging rapidly - so rapidly, in fact, that the next wave, Agentic AI, is arriving before chatbots and copilots reach version 2.0.
- Agentic AI represents a new generation of increasingly powerful foundation models that act as operating systems for autonomous, action-taking, digital agents capable of enhanced reasoning and decision-making, as well as increasingly disruptive chatbots and copilots.
- Over the next decade, these fully autonomous agent and robot fleets may ultimately alter verticals heavily reliant on human capital and spark a corporate efficiency revolution that transforms the global economy.

The newest AI wave is here

Despite claims that the pace of AI innovation is plateauing, new and disruptive AI capabilities appear to be emerging on a weekly, if not daily, basis.[1] AI capabilities are advancing at such a rapid rate, in fact, that AI agents may complete end-to-end software engineering tasks, answer customer service calls or book your next vacation, and a robot may assemble the vehicle you drive, perform precision surgery or serve you a drink before many enterprise pilots reach production.

Although action-taking agents capable of completing complex open-ended tasks remain immature, BofA Global Research expects enterprise adoption of chatbots and copilots to accelerate over the next one to three years as capabilities improve and use cases expand. However, over the next decade, fully autonomous agent and robot fleets may ultimately alter verticals heavily reliant on human capital, sparking a corporate efficiency revolution that transforms the global economy.

AI advances are occurring so rapidly that Agentic AI, the next AI wave, is arriving before chatbots and copilots reach version 2.0. But let's back up. What is Agentic AI? Put simply, it's a type of AI that can act autonomously to make decisions and take actions to achieve a goal without explicit instructions. Think: a proactive, AI-powered agent. It represents a new generation of increasingly powerful foundation models that act as operating systems for autonomous, action-taking, digital agents capable of enhanced reasoning and decision-making, as well as increasingly disruptive chatbots and copilots.

This Agentic AI wave could spark accelerated development and deployment of AI-powered apps, as well as industrial and commercial robots sooner than anticipated. And, fully autonomous agent and robot fleets may ultimately transform verticals heavily reliant on human capital, catalyzing a corporate efficiency revolution that transforms the global economy (see our recent publication, AI: From evolution to revolution? for more). Could we be approaching a super cycle of innovation that accelerates advances and disruption?

The pace of AI innovation is accelerating

AI adoption faster than that of the PC and internet

Generative AI (GenAI) emerged after eight decades of iterative advances that raised the upper bounds of computational capacity and reduced the time and cost to train capital-intensive foundation models. However, the third wave, Agentic AI, arrives only two years after ChatGPT launched and AI's second wave, GenAI, began (Exhibit 1). GenAI adoption across both consumer and enterprise occurred more rapidly than for the PC and internet, but BofA Global Research expects enterprise GenAI adoption to continue at an accelerated rate.[2] Futuristic agents are exciting, but equally exciting are how tech advances that enable agent capabilities also drive improved chatbots and copilots.

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[1] Even if AI model advances were to completely halt tomorrow, BofA Global Research believes that it could take 3-5 years for current AI capabilities to be fully integrated into AI apps and enterprise processes.
[2] "*The Rapid Adoption of Generative AI*," NBER Working Papers 32966, National Bureau of Economic Research, Inc. Alexander Bick & Adam Blandin & David J. Deming, 2024.

Chatbots, copilots and agents that demonstrate enhanced capabilities, including the ability to complete tasks autonomously, recognize mistakes, refine their "thought" process and call external functions are just beginning to emerge. However, it may not be long until your next colleague is software.

Exhibit 1: Agentic AI and autonomous action-taking agents mark the beginning of AI's third wave
The AI Waves – from the first wave beginning in the '40s to the third wave beginning now

	The AI Waves		
	First Wave	Second Wave	Third Wave
Technology	Pre-GenAI	GenAI	Agentic AI
Time	1940 - Nov'22	Nov'22 - Oct'24	Oct'24 - TBD
Applications	NA	Chatbots & Copilots	Autonomous Agents

Source: BofA Global Research
Nov'22 represents ChatGPT's launch on Nov 30, 2022, which marked the beginning of the GenAI wave, in our view. We list apps for the first wave as "NA" because ChatGPT introduced the consumer-friendly user interface that democratized access to powerful computer intelligence.

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From student intern to PhD

Significant AI advances at the model and application level are occurring more rapidly than anticipated. One year ago, chatbots for generalized tasks and copilots for specialized ones were as proficient as a student intern, but today, they display, or even surpass, PhD-level intelligence on some tasks. For example, OpenAI's model exhibits intelligence that surpasses that of a PhD on some tasks and Anthropic's introduction of functionality that enables models to mimic how humans use computers provides a significant leap forward.

Although BofA Global Research notes that the current level of intelligence may be high enough for chatbots and copilots to support some open-ended tasks and processes, such as customer service, functionality remains rather primitive in its current state and further development is likely needed. For example, AI performance remains far below that of an average human when asked to complete retail and airline-related customer service tasks.

The AI evolution could become a revolution

Not technological singularity but a super cycle of innovation may be ahead

AI's near-term disruption should not be diminished in this early stage. While AI advances may not unleash Artificial Super Intelligence (ASI) or the technological singularity any time soon, agent capabilities and use cases, which will likely be more holistic and disruptive than those of chatbots and copilots, may improve and expand rapidly.[3] AI capabilities will likely accelerate as computational capacity increases 2-3x per year without incremental costs or energy consumption, and agent functionality extends from computers to humanoids, industrial machinery, lab instruments, restaurant equipment and autonomous vehicles.[4]

In fact, we may be approaching an accelerating super cycle of innovation, in which increasingly powerful models produce increasingly powerful apps that in turn, drive additional model advances and app capabilities.

As capabilities expand, use cases increase

Foundation model capabilities are improving as they become larger and as new training techniques are implemented. Next-gen frontier models are reaching production and may cost more than $1 billion, a 10x increase relative to the training costs of the prior generation, but increasingly large and powerful models also facilitate the development of disruptive applications. Chatbots for general tasks and copilots for specialized ones will likely gain increasingly disruptive functionality as the underlying foundation models that power them advance, but these advances also enable agents, i.e., Agentic AI.

Chatbots and copilots will ultimately complement agents as they develop and mature, but consumer and enterprise adoption of them may accelerate as capabilities advance. BofA Global Research expects consumer and enterprise GenAI usage to increase throughout this year before accelerating in 2026 as consumer products integrate GenAI features and as pilots move to production. AI tools are already capable of generating high-quality code, text and images, producing research, analyzing trends, and optimizing processes, but only 32% of US adults reported using GenAI tools on a weekly basis, with only 11% reporting daily use at work.[5]

And while AI tools already drive meaningful efficiency and productivity benefits, the next generation may significantly expand disruption. Adoption could accelerate across industries like contact centers, software engineering and marketing as cost savings

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[3] Artificial General Intelligence (AGI) refers to AI systems that possess capabilities in line with human intelligence. Artificial Super Intelligence (ASI) refers to AI systems that possess capabilities that surpass the intelligence of the most gifted humans. Technological singularity refers to a hypothetical scenario in which technological growth becomes uncontrollable and irreversible.
[4] Bloomberg: Nvidia CEO Says 'Reasoning' AI Will Depend on Cheaper Computing.
[5] GenAI tools include apps like ChatGPT, Microsoft Copilot and Adobe Firefly. Stats as of Aug'24. Citation: "*The Rapid Adoption of Generative AI,*" NBER Working Papers 32966, National Bureau of Economic Research, Inc. Alexander Bick & Adam Blandin & David J. Deming, 2024.

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become too large to ignore. Yet, as agent functionality extends, adoption and disruption may quickly expand to biopharma, human resources (HR), nursing, education, cybersecurity and manufacturing, among others.

The robots are coming!

In 2018, ~60% of jobs were in occupations that didn't exist in 1940, illustrating the dynamic nature of the US economy. While new occupations may emerge as foundation models and AI-powered apps advance and as companies implement AI tools into products and processes, BofA Global Research believes that new jobs resulting from the newest AI wave are unlikely to emerge fast enough to offset AI-driven displacement.[6]

We frequently hear discussions around how AI may disrupt occupations that employ knowledge workers. For instance, ChatGPT launched less than two years ago, but within eight months of its launch, findings from an academic paper indicate that jobs related to writing and coding on a global freelancing platform had already dropped 21%.[7] Professional and creative pursuits of the future may bear little resemblance to how they look today due to AI-powered apps.

But far less discussed is how AI may disrupt occupations that employ physical workers. BofA Global Research expects emerging robotic capabilities to extend potential disruption from customer-service agents, software engineers, marketing professionals, paralegals, medical scribes and nurses to warehouses, restaurants, construction, landscapers and drivers.

In fact, robots are already largely integrated into industrial processes. Amazon and DHL Supply Chain leverage 750,000 and 7,000 robots, respectively, some of which can unload boxes at twice the speed of humans and process packages 25% faster.[3] However, BofA Global Research expects improved general-purpose robots at reduced cost to drive robots out of the warehouse and into new verticals beginning in 2026 as certain humanoid robots reach production.[8]

Exhibit 2: Industrial robot installations have not yet begun to fully accelerate
Industrial robot installations globally (in thousands) from 2015-2023
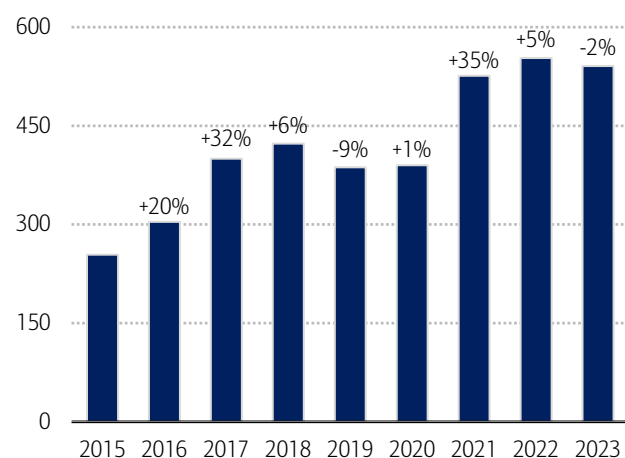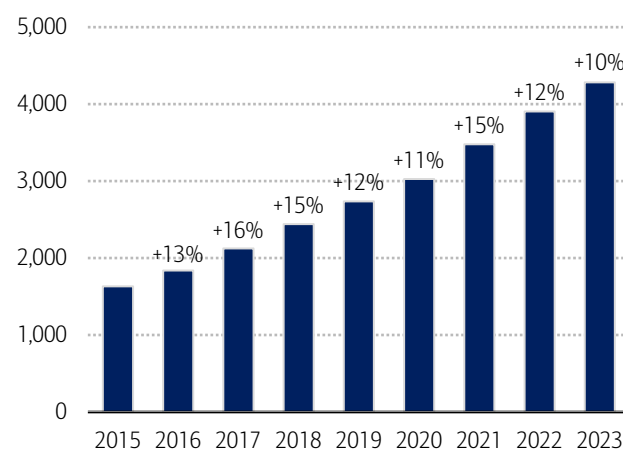

Source: International Federation of Robotics; BofA Global Research
Data labels indicate the % change y/y in the total number of newly installed industrial robots globally.

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Exhibit 3: There were 4mn+ industrial robots in operation globally in 2023, up 10% from the prior year
Industrial robots in operation globally (in thousands) from 2015-2023

Source: International Federation of Robotics; BofA Global Research
Data labels indicate the % change y/y in the total number of newly installed industrial robots globally.

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Some occupations will be lost as AI "dot com" startups emerge

We have yet to see the potential momentum of the thousands of innovative AI "dot com" startups that represent a new breed of lean companies that are unburdened by the need to maintain legacy infrastructure and can scale rapidly without proportional increases in headcount. AI startups may drive the creation of new businesses over the next 5-10 years that introduce new service as a software (SaaS) business models, which increasingly cannibalize the significantly larger $12.3 trillion US services industry.[9] The new SaaS model leverages vertical GenAI apps for specialized use cases that aim to transform previously unscalable businesses reliant on human capital and manual processes into software products.

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[6] NBER: New Frontiers: The Origins and Content of New Work, 1940–2018.
[7] Demirci, Ozge and Hannane, Jonas and Zhu, Xinrong, Who Is AI Replacing? The Impact of Generative AI on Online Freelancing Platforms (October 15, 2023).
[8] There were 1.8mn warehousing and storage workers that earn ~$25/hour on average as of Oct'24, according to the US Bureau of Labor Statistics.
[9] Department of Commerce - Bureau of Economic Analysis, IDC.

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Disclosures