# The Economics of AI: A Brief Tour

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## Microeconomics of AI

- How will AI change work?

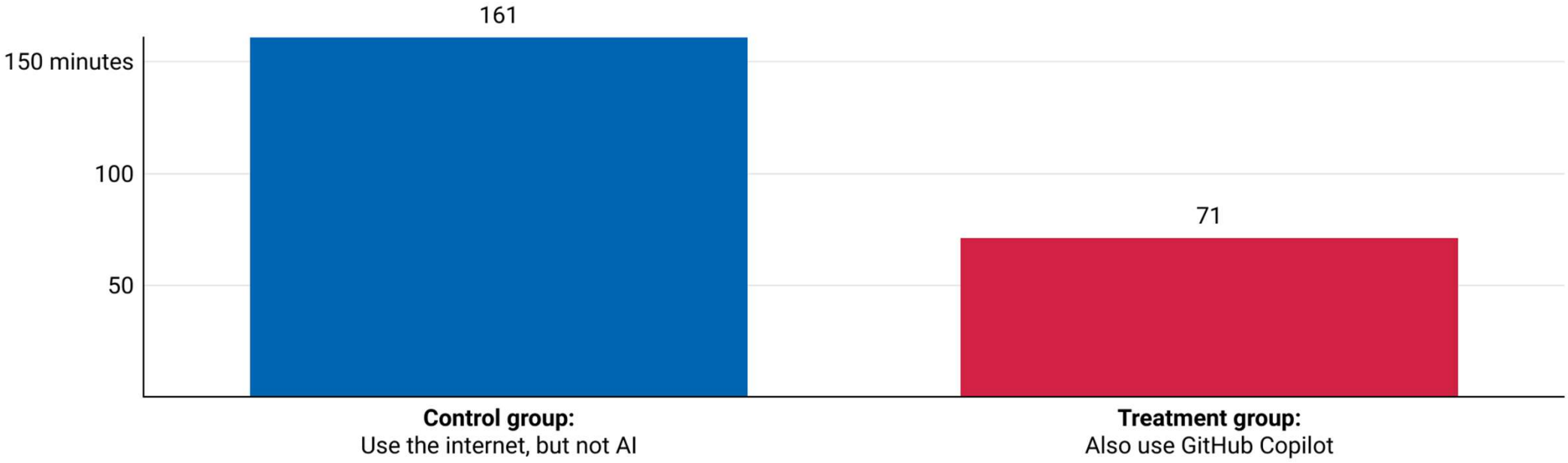
# 3 business case studies

# Access to an AI coding assistant led coders to complete their tasks

## 56% faster

*Coders were tasked with implementing an HTTP server using Javascript. The control group used their typical workflow. The randomly-assigned treatment group were also given access to an AI coding assistant.*

*Average time to complete the coding task*



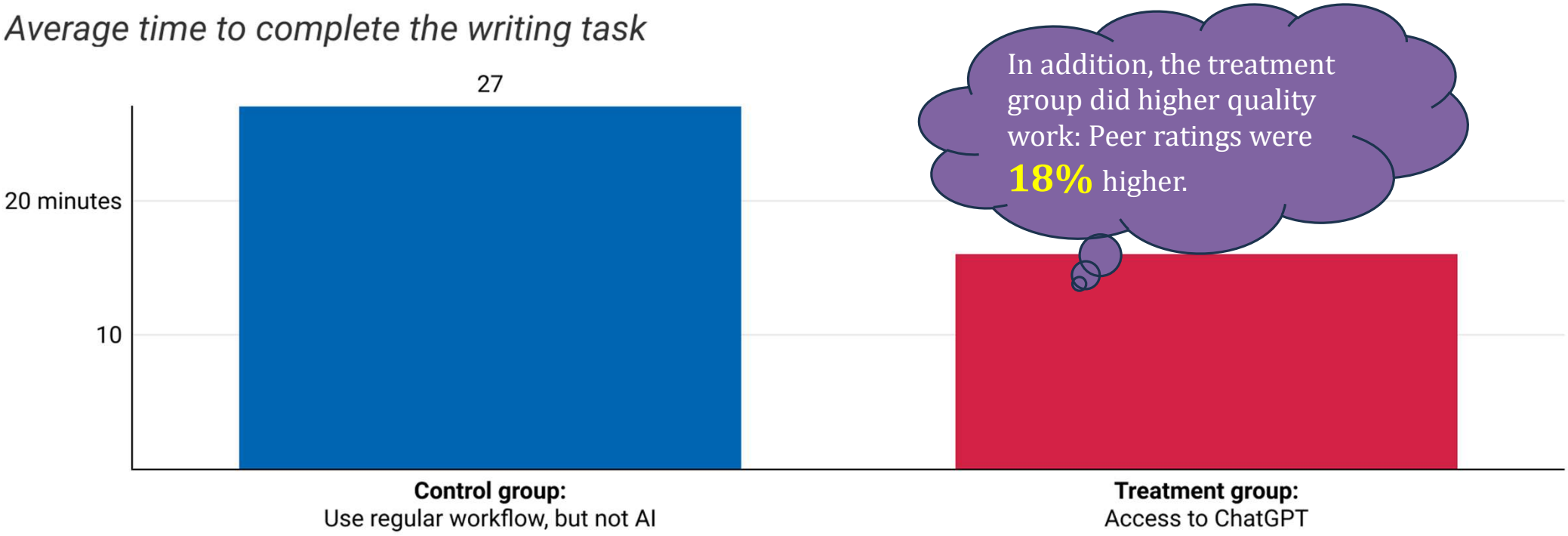

n=95 freelance coders recruited from Upwork.

Chart: @JustinWolfers • Source: Peng, Kalliamovokou, Cihon, and Demierer (2023), The impact of AI on developer productivity: Evidence from Github Copilot"

# Access to ChatGPT led office workers to do professional writing tasks 40% faster

*White collar workers were assigned tasks such as writing press releases, short reports, analysis plans, and delicate emails, and they were paid for producing quality work. The randomly-assigned treatment group was instructed to sign up ChatGPT 3.5, while the control group was not.*

*Average time to complete the writing task*



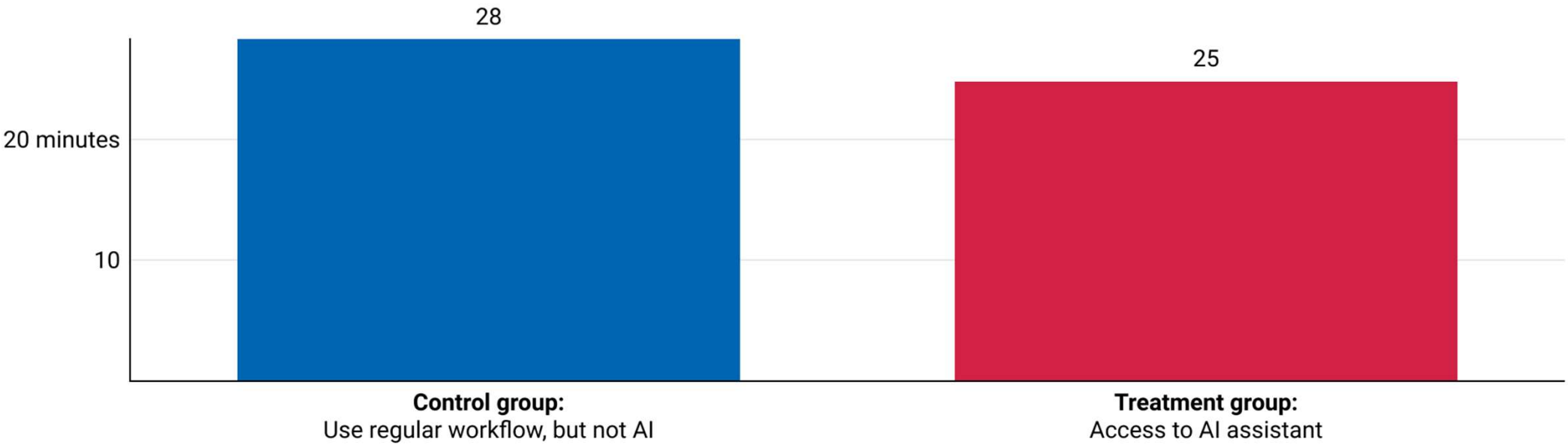

n=453 college-educated professionals recruited through Prolific.

Chart: @JustinWolfers • Source: Now and Zhang (2023), "Experimental evidence on the productivity effects of generative artificial intelligence"

# Using an AI chat assistant led online customer service staff to resolve issues 14% faster

*In the treatment group, technical support staff were provided with an AI assistant that provides suggested responses (which they could use or ignore). Workers in the control group were those who were yet to receive access to this tool.*

*Average time to close a customer support ticket*




n=3 million chats from 5,179 customer support agents at a Fortune 500 software firm.
Results are from difference-in-difference estimators that compare an agent's responses before and after gaining access to the chat assistant, and control for potential confounders.

Chart: @JustinWolfers • Source: Brynjolfsson, Li, and Raymond (2023), "Generative AI at Work"

## Case study #4: Boston Consulting Group

- 758 consultants were assign different consulting tasks
- Assigned to no AI access, GPT-4, or GPT-4 plus a prompt engineering review
- Completed 12/2% more tasks, and each task was completed 25.1% quicker(?)
- Higher quality results (40%?)
  - Below average +43%
  - Above average +17%

- Mis-use: On tasks that were outside AI frontier, those using AI had 19%-pts lower likelihood of being correct.

## What's different about the labor market effects of AI?

"Unlike most advances in automation in the past, it is a machine of the **mind** affecting **cognitive work**."

Source: Baily, Brynjolfsson, and Korinek (2023), "Machines of mind: The case for an AI-powered productivity boom"

# Which jobs are vulnerable to being automated by AI?

**80%** of (US) workers have >10% of their tasks affected

**50%** of (US) workers have >50% of their tasks affected

Jobs where **0%** of tasks can be automated

- Athletes
- Cooks
- Dishwashers
- Floor layers
- Meatpackers
- Tire repairs
- Tradesmen's helpers

Jobs where **100%** of tasks can be automated

- Copy editors
- Financial analysts
- Survey researchers
- Tax preparers
- Translators
- Web designers

Source: Eloundou, Manning, Mishkin, and Rock (2023), "GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models"

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Jobs where **0%** of tasks can be automated

Jobs where **100%** of tasks can be automated

Writers and authors, survey researchers, public relations specialists, interpreters and translators, web designers, financial analysts, court reporters, caption writers and tax preparers.

Physical labor

Science and critical thinking skills

Programming and writing skills

# AI will have uneven effects across sectors

*Share of work tasks that could be automated by AI*

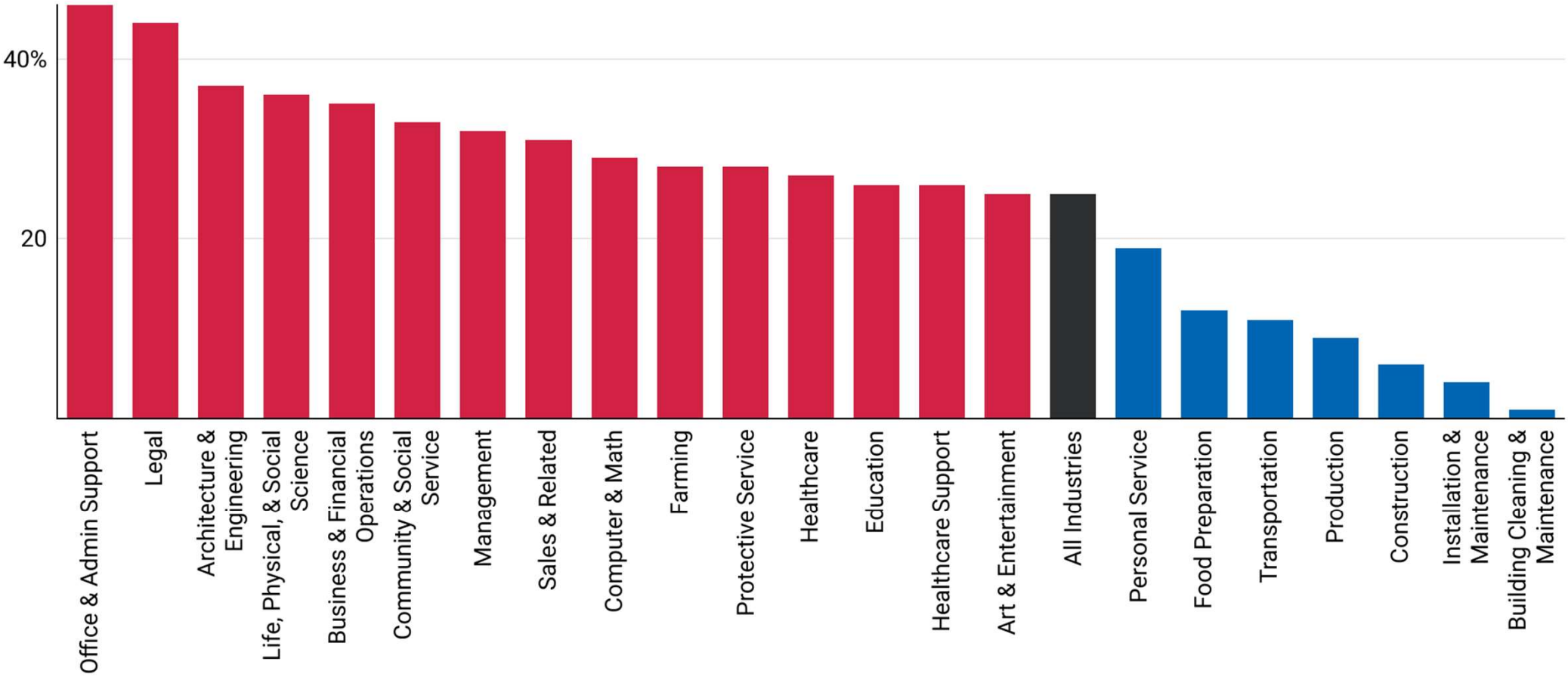



Chart: @JustinWolfers • Source: Goldman Sachs, "The Potentially Large Effects of Artificial Intelligence on Economic Growth"

## Microeconomics of AI

- How will AI change work?

## Macroeconomics of AI

- Add it up (and maybe multiply)

## Political economy of AI

- Dividing the pie

## Me-conomics of AI

- How **you** can adapt

# A task-based view

AI could transform 20% of all tasks

= AI affects a large share of the economy (but not all)

Source: Acemoglu (2024), “The Simple Macroeconomics of AI”

# A task-based view

AI could transform 20% of all tasks

×

Only 23% of these tasks can be cost-effectively automated

= 20% x 23% = **4.6%**

of tasks will be done by AI

Source: Acemoglu (2024), "The Simple Macroeconomics of AI"

# A task-based view

AI could transform 20% of all tasks × Only 23% of these tasks can be cost-effectively automated × Automating a task yields a 27% labor saving = 20%×23%×27% = 1.2%

reduction in labor costs

Source: Acemoglu (2024), "The Simple Macroeconomics of AI"

# A task-based view

Productivity boost
(doing more with less)

AI could transform 20% of all tasks × Only 23% of these tasks can be cost-effectively automated × Automating a task yields a 27% labor saving × Labor accounts for only 53% of costs

= 20%×23%×27% %×53% = **0.66%**
reduction in production costs

Economists also call this a rise in **total factor productivity**

Source: Acemoglu (2024), "The Simple Macroeconomics of AI"

# A task-based view

Productivity boost
(doing more with less)

AI could transform 20% of all tasks × Only 23% of these tasks can be cost-effectively automated × Automating a task yields a 27% labor saving × Labor accounts for only 53% of factor costs

+ Proportionate 0.66% increase in capital investments × Capital : Output ratio is 0.73

= 0.66% + 0.66%×0.73= **1.1%**

rise in GDP
over the next decade

"Capital deepening"
(investments in AI)

Source: Acemoglu (2024), "The Simple Macroeconomics of AI"

# Let's get more optimistic

Different approach (not a big deal)

The price of AI is falling dramatically

Some case studies yield better outcomes

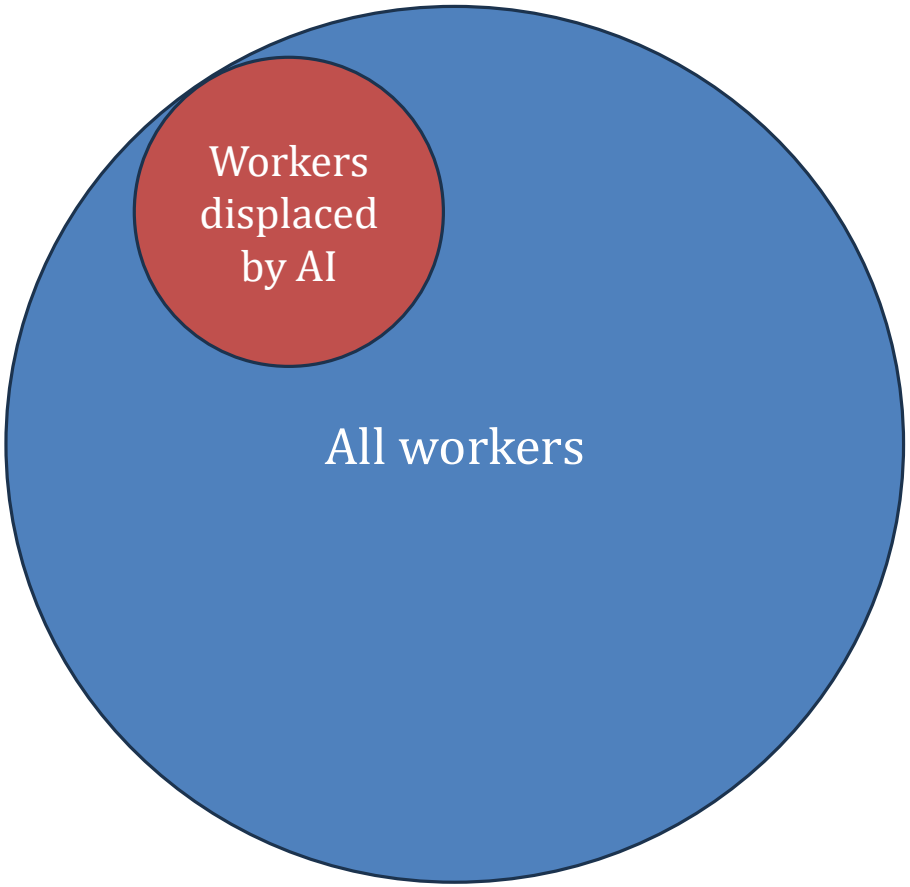
AI could transform **25%** ~~20%~~ of all tasks × ~~Only 23%~~ **All** of these tasks can be cost-effectively automated × Automating a task yields a ~~27%~~ **36%** labor saving × Labor accounts for only 53% of costs = **4.7%** rise in productivity

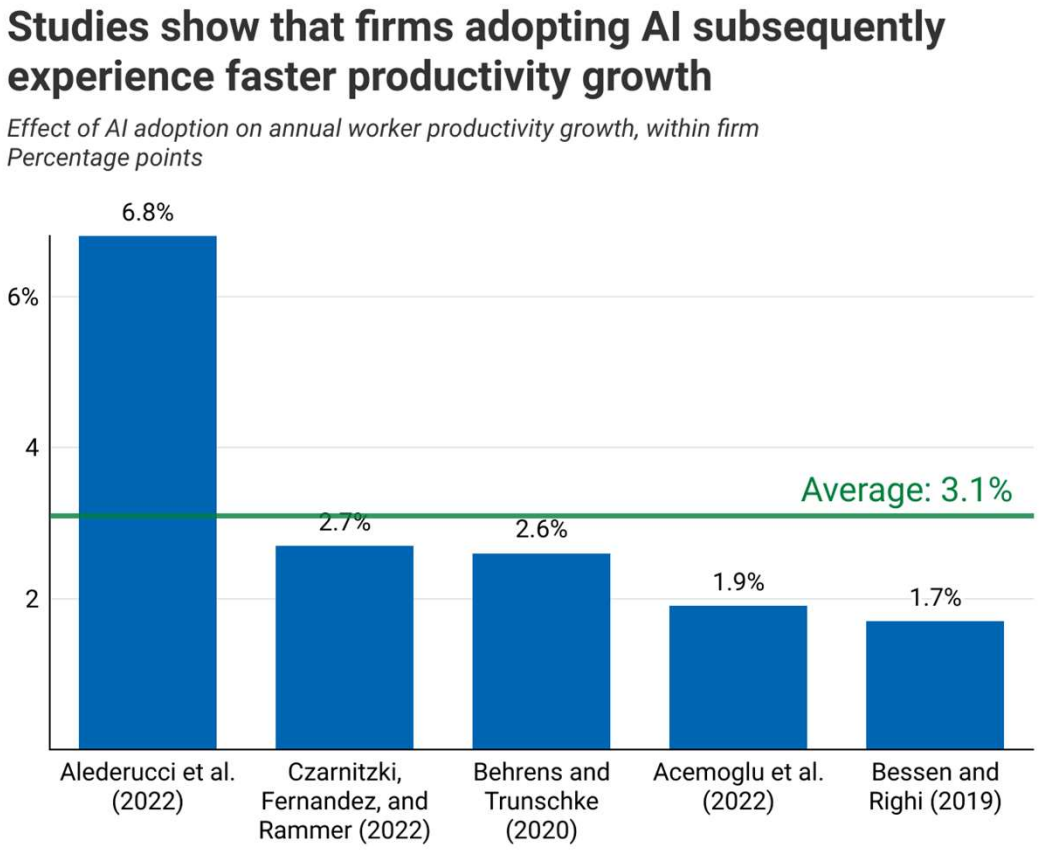
\+ **Proportionate** 4.7% ~~0.66%~~ increase in capital investments × Capital : Output ratio is 0.73 = 4.7% + 4.7%×0.73 = **8%** rise in GDP over the next decade

Source: Goldman Sachs (2024), "Addressing the AI growth debate"

# What's missing?

# Non-displaced workers become more productive using AI




Source: Goldman Sachs (2024), "Addressing the AI growth debate"

# Tech revolutions reallocate workers to new and productive jobs

## Some occupations shrank

*Share of employment, 1940 and 2020*


Chart: @JustinWolfers • Source: IPUMS

## Some occupations grew

*Share of employment, 1940 and 2020*

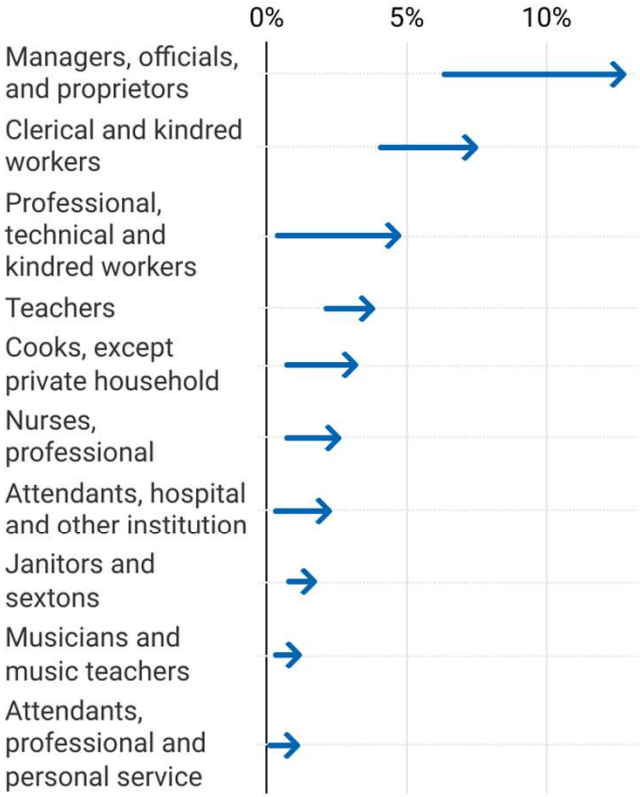



Chart: @JustinWolfers • Source: IPUMS

## New occupations emerged

*Share of employment, 1940 and 2020*

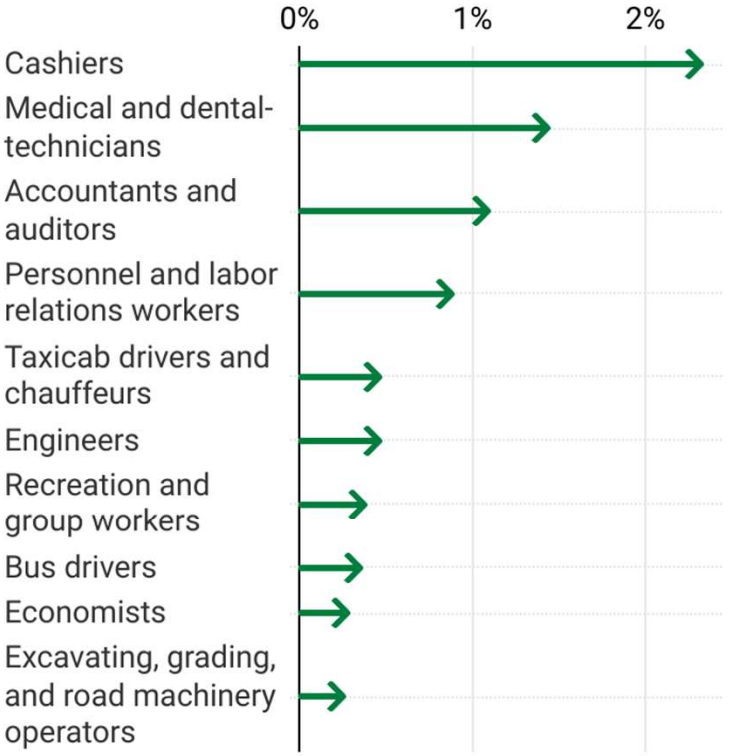



Chart: @JustinWolfers • Source: IPUMS

# If AI could raise the productivity of innovators by 20%, it could raise output growth from a 2% baseline to 2.4% with AI, and a small change in growth compounds into big gains

*Output, relative to 2024*

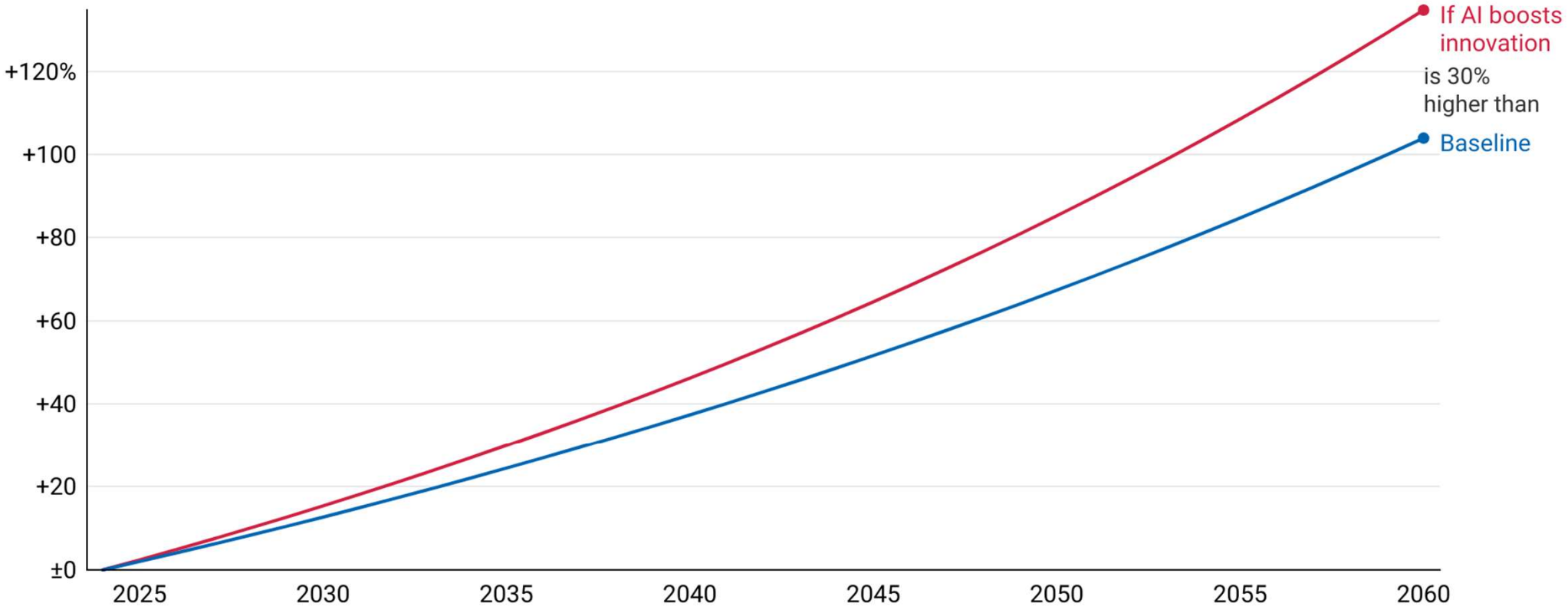



Chart: @JustinWolfers • Source: Baily, Brynjolfsson, and Korinek

# Estimated effects of AI on the level of US GDP in ten years time

*Central estimate, by forecaster*

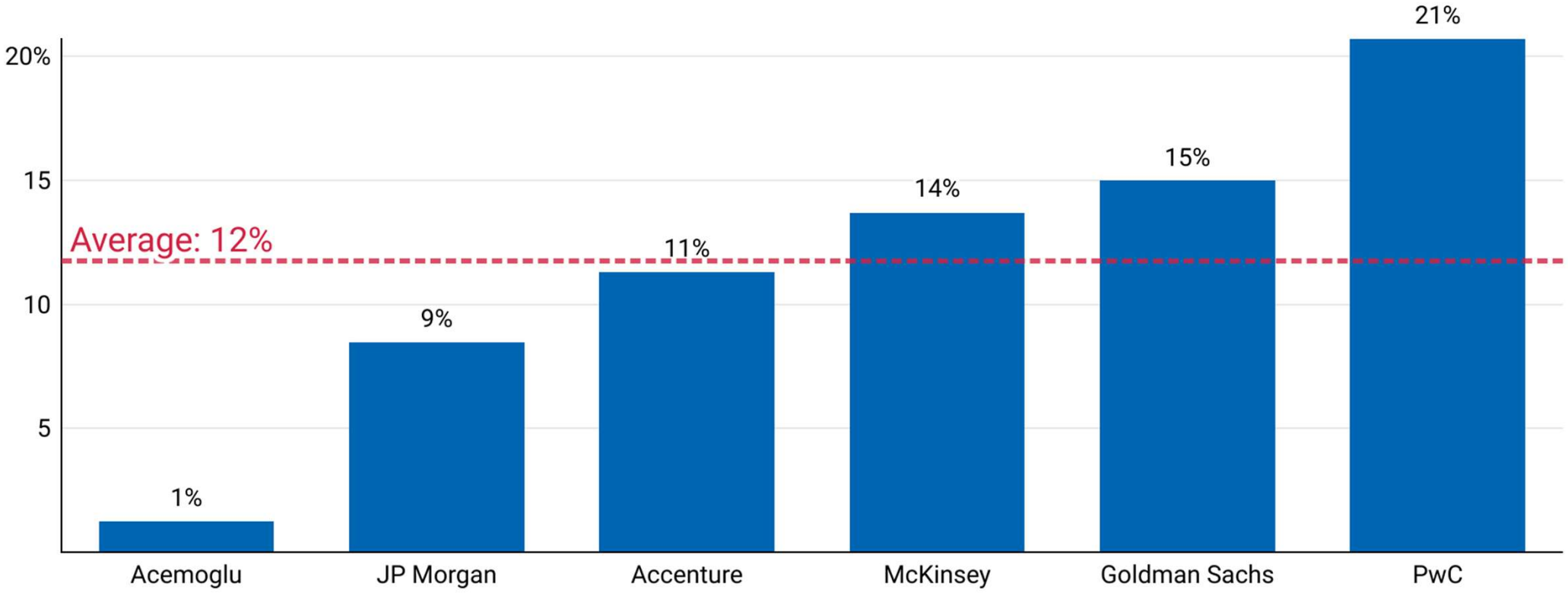
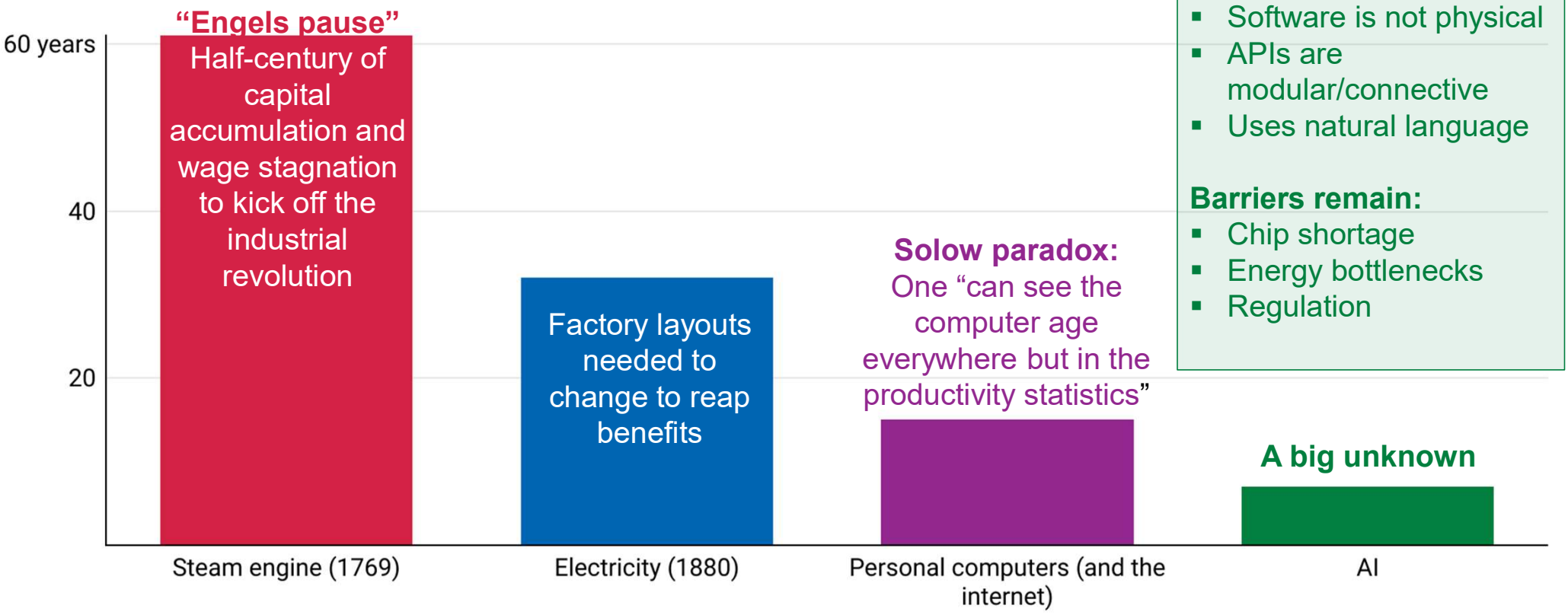



Chart: @JustinWolfers • Source: JP Morgan

Source: JP Morgan (2024), "How AI can boost productivity and jump start growth"

# Major innovations often don't deliver productivity growth until work has been reorganized around them

*Numbers of years between invention and the boost to productivity*




**Adopting AI simpler:**

- Software is not physical
- APIs are modular/connective
- Uses natural language

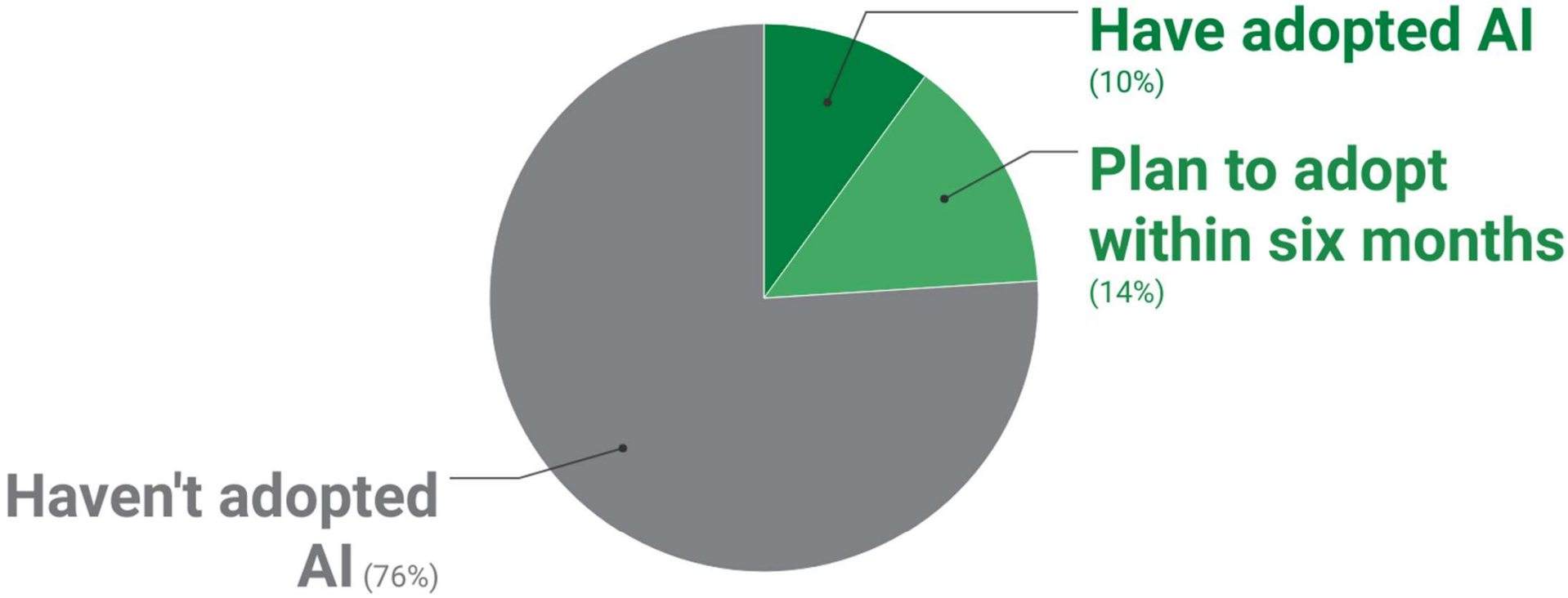
**Barriers remain:**

- Chip shortage
- Energy bottlenecks
- Regulation

Chart: @JustinWolfers • Source: JP Morgan drawing on the economic history literature

# Remarkably few U.S. businesses have adopted AI

*Share of businesses, October 2025*

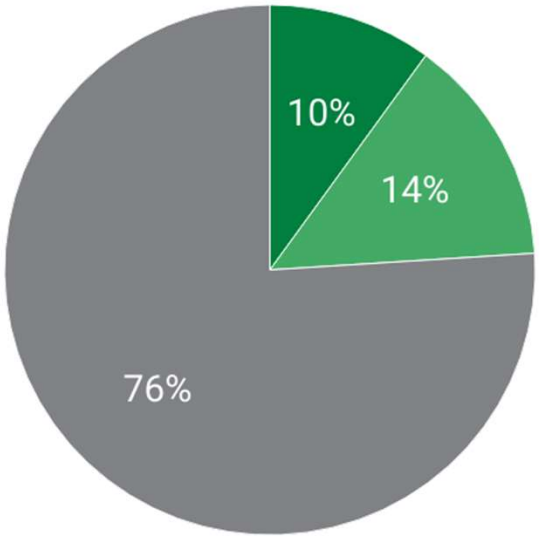



Adopted AI: *During the next six months, do you think this business will be using Artificial Intelligence (AI) in producing goods or services?"*
Plan to adopt: *During the next six months, do you think this business will be using Artificial Intelligence (AI) in producing goods or services?*
Examples of AI: *Machine learning, natural language processing, virtual agents, voice recognition, etc.*

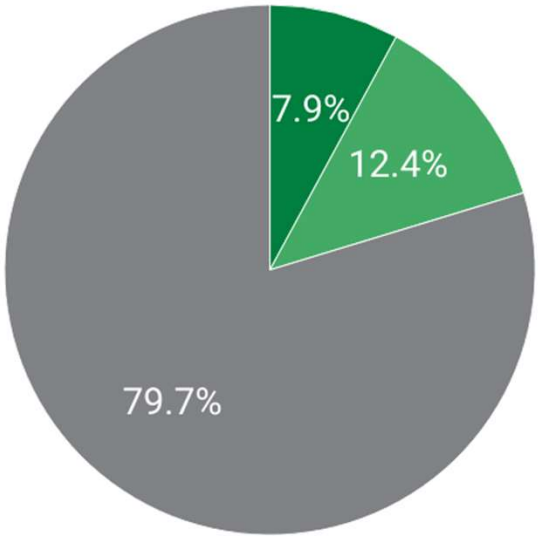
Chart: @JustinWolfers • Source: U.S. Census Bureau Business Trends and Outlook Survey 2025 Survey #20

# Remarkably few businesses have adopted AI or intend to in the next 6 months

*Share of businesses, October 2025*




United States




Michigan
(Go Blue)

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# How transformative will AI be in our lifetimes?

## Microeconomics of AI

- How will AI change work?

## Macroeconomics of AI

- Add it up (and maybe multiply)

## Political economy of AI

- Dividing the pie

## Me-conomics of AI

- How **you** can adapt

## Understanding the disruption as an **ownership** problem

- Imagine that **you** own a robot that can do all of your work for you
  - Are you better off? **Yes**
  - Is your boss better off? **No**
    (but they're not worse off, either)
- Imagine that **your employer** owns a robot that can do all of your work without you
  - Are you better off? **No**
  - Is your boss better off? **Yes**

→We don't have a **robot problem** (or an AI problem)

…but we do have an **ownership problem**

## Understanding the disruption as a competition problem

- Imagine that **Open AI, Google, Facebook, and many other competitors** each own competing AI models that can do all of your work
  - Are you better off? **No**
  - Is your boss better off? **Yes**
    (They buy your replacement for pennies)

- Imagine that **a monopoly AI company** owns an AI model that that can do all of your work
  - Are you better off? **No**
  - Is your boss better off? **No**
  - Is the monopolist better off? **Yes**
    (They charge your boss your old wage, less a penny)

→We don't have a **robot problem** (or an AI problem)

…but we might have a **competition problem**

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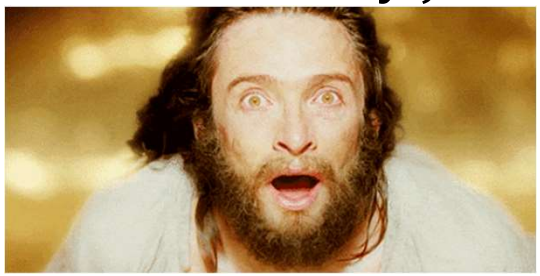
# The three stages of the AI rollercoaster

1. This can do my job!

2. This can do my job!

# The three stages of the AI rollercoaster

1. ***This*** can do my job!



2. This can do ***my*** job!


3. Working together, this can **help** me do a ***better*** job

Substitute ← AI will **displace** some workers

versus

Complement ← AI will **augment** others

# Understand the opportunity

## From Computer code…

- Explicit instructions transform inputs to outputs
  - Task must written in code

→ Use for **codified** knowledge

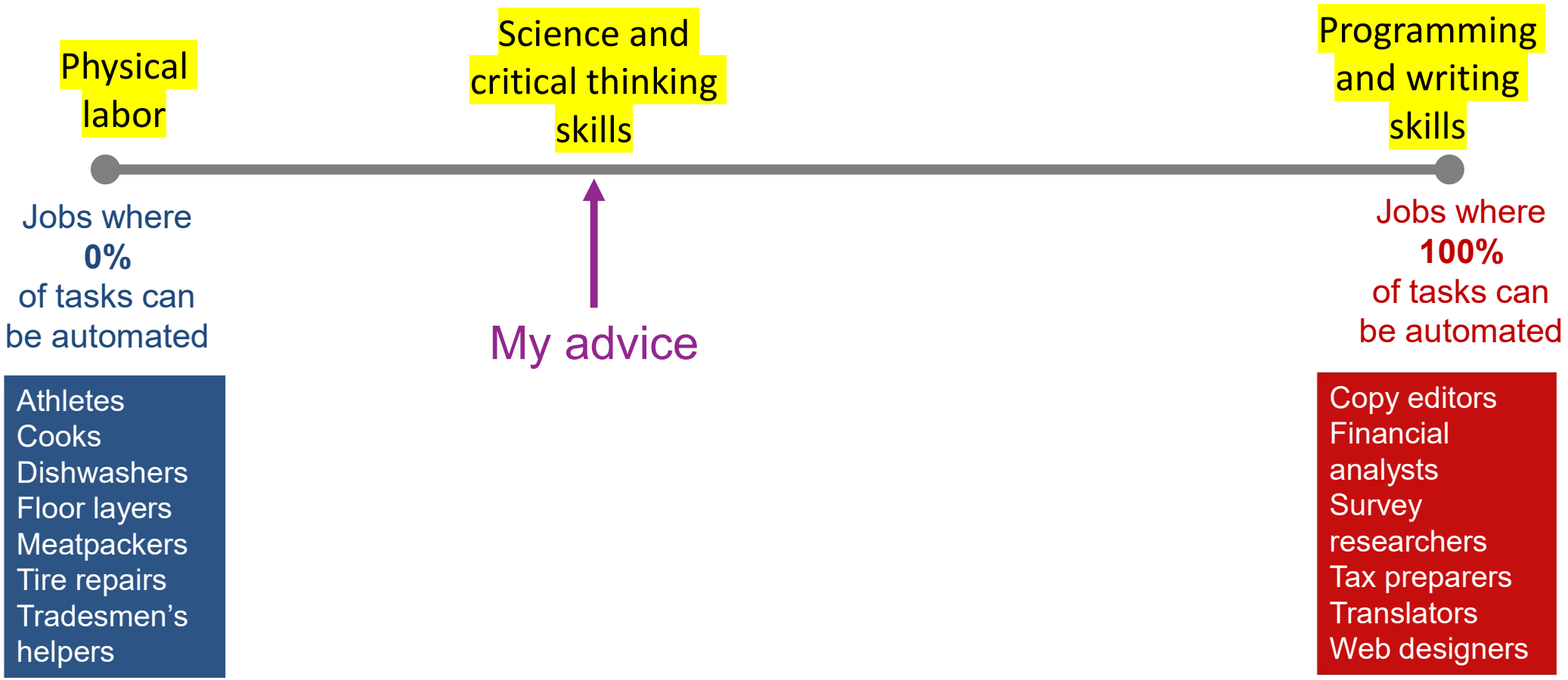
## …to AI

- *Infer* instructions from examples
  - Can perform tasks even when no instructions exist

→ Use for **tacit** knowledge

→ Previously could only be gained through lived experience

# Invest in new skills wisely




Source: Eloundou, Manning, Mishkin, and Rock (2023), "GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models"

## Instead of focusing on **shortcomings**, learn to help **AI succeed**

- AI **hallucinates**
  - Set "temperature" = 0
- Responses are **formulaic**
  - "Sharpen that response"; "write like Hemmingway"
- It makes simple **math errors**
  - "And check your answer in Python"
- AI lacks **creativity**
  - I'm not so sure
- Computers lack **empathy**
  - Good prompting can yield empathy
  - AI doesn't get tired and cranky

## Expand your uses

- Everyday open an LLM in a spare tab, and make sure you try it for **at least one new task**
- Some examples
  - Edit your writing
  - Name your next company, design a logo, and come up with advertising slogans
  - Plan your next vacation
  - Extract data from a chart
  - Learn a new language
  - Brainstorm new product ideas
  - Write your code
  - Write (or rewrite) your social media posts
  - Write a bedtime story for the kids in your life
  - Read financial statements and predict future corporate earnings
  - Write your own apps! [Claude code]

## Microeconomics of AI

- How will AI change work?

## Macroeconomics of AI

- Add it up: How will it change the economy?

## Political economy of AI

- Dividing the pie: What are the political divides?

## Me-conomics of AI

- Bringing it back to you: How **you** can adapt