AI: ECONOMIC EFFECTS AND POLITICAL ECONOMY CONSIDERATIONS

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The views expressed are those of the author and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

Roadmap

1. Introduction

2. Labor market impact
   - Jobs at risks and jobs protected
   - Potential for reallocation
   - Inequality

3. Structural transformation

4. Productivity

5. Monopoly power and financial implication

6. Political economy

7. Regulation

8. Preparedness

9. Conclusions

AI salience

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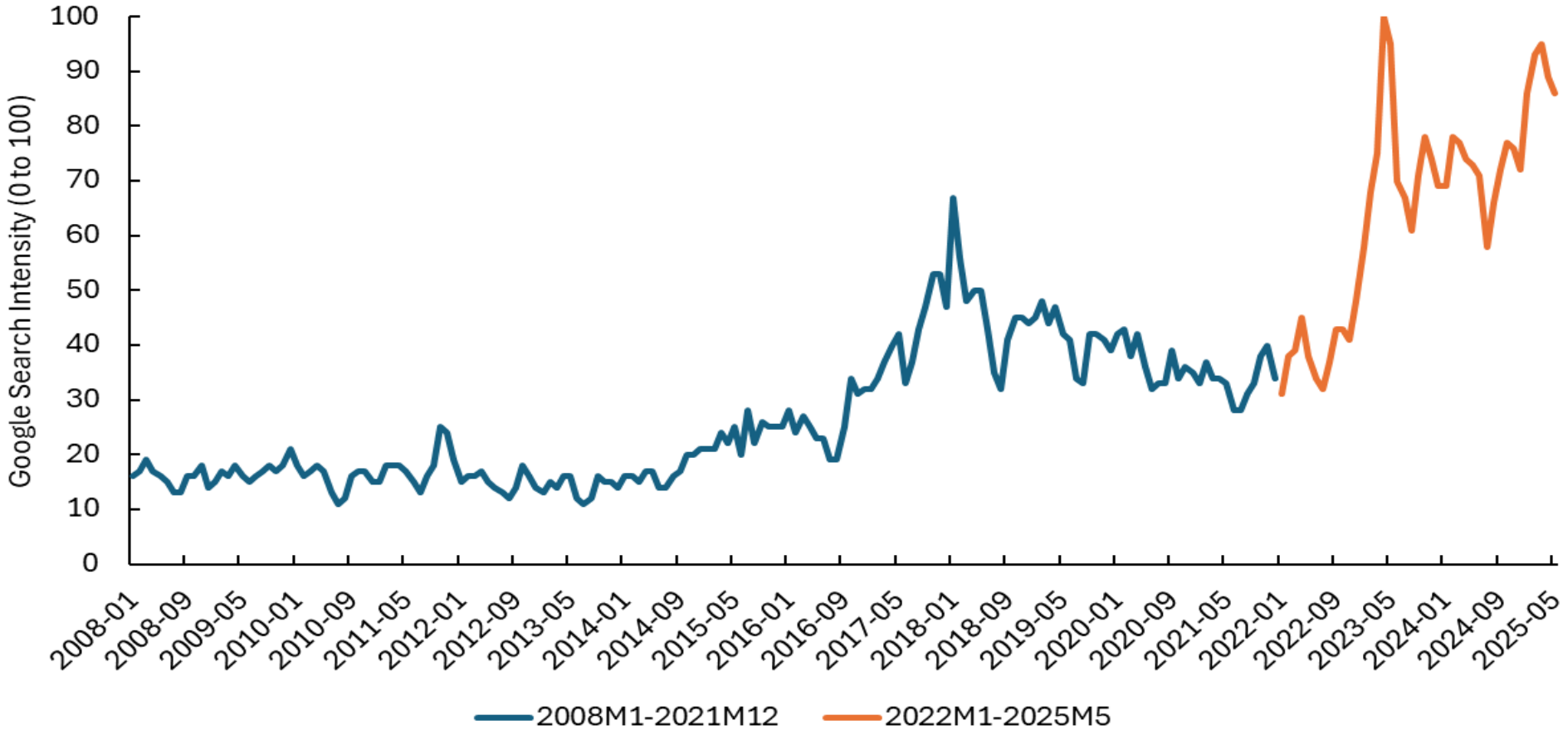
Google search trend intensity for phrase “artificial intelligence”



Sources: Google Search Trend, and IMF staff calculations.
Note: The plot shows the Google Search Trend intensity (0-100) for phrase “artificial intelligence” from 2008M1 to 2025M5.

Dolly created a lot of hopes and concerns ...

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The Economist
https://www.economist.com › leaders › 1998/01/15 › f...

Fear of cloning

Jan 15, 1998 — **Dolly**, the first mammal to be cloned from an adult, was the only success out of many attempts. Moreover, scientists do not yet know whether cloning will produce ...

Washington Post
https://www.washingtonpost.com › cloning › cloning6

Human Cloning Isn't as Scary as It Sounds

Mar 2, 1997 — These **concerns** are not about **Dolly**, the now famous **sheep**, nor even about the ...

If our **fear** is that there could be many couples with that sort of psychology ...

....Could humans be cloned?

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What AI can do now and in the future?

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Current AI Capabilities

- Language and Image Recognition
- Predictive Analytics and Automation: Forecasting; industrial task automation
- Healthcare and Robotics: Medical diagnostic and treatment aid
- Assistants and Recommendation Systems: Virtual assistant services; personalized recommendation

(Near) Future AI Capabilities

- Advanced General Intelligence
- Enhanced Personalization and Collaboration: Customized AI services; seamless workplace AI integration
- Autonomous Vehicles and Healthcare: Self-driving car; advanced medical AI applications

Measuring exposure to and complementarity with AI

Introduction

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- **Jobs at risks**
- Reallocation
- Inequality

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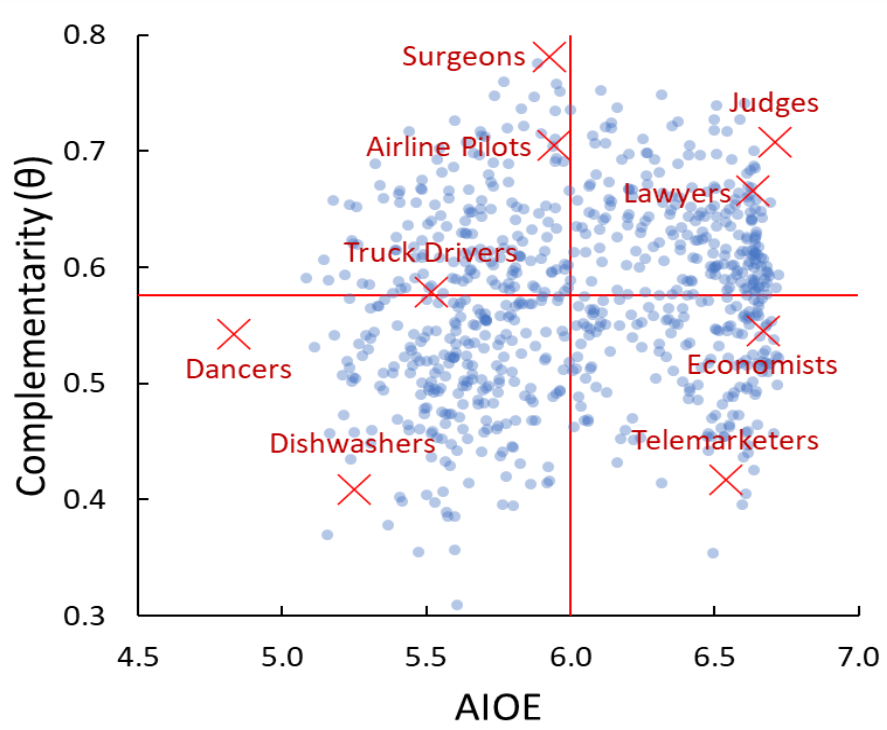
- Intuition: jobs are bundle of tasks
  - Some tasks can be performed by AI
  - BUT some tasks are shielded by social, ethical, physical context, and skill levels factors (Index developed by **Pizzinelli** et al., 2023)
- Examples:
  - Judges: High AI exposure yet shielded by societal norms and laws—AI may complement their work, enhancing productivity
  - Clerical Workers: High AI exposure with low shielding—higher displacement risk
- Complementarity potential: :
  - Shielding factors: Social, ethical, physical context, and skill levels required by occupations.
  - Indicates occupations' protection from AI job displacement and identifies complementarity potential
  - High complementarity potential derives from high AI exposure and high shielding.

Conceptual Diagram of AI Exposure (AIOE) and Complementarity (θ)



Sources: Felten, Raj, and Seamans (2021); Pizzinelli and others (2023); and IMF staff calculations.
Note: Red reference lines denote the median of AIOE and complementarity.

Exposure and complementarity

Definition and timeline

Labor market

- **Jobs at risks**
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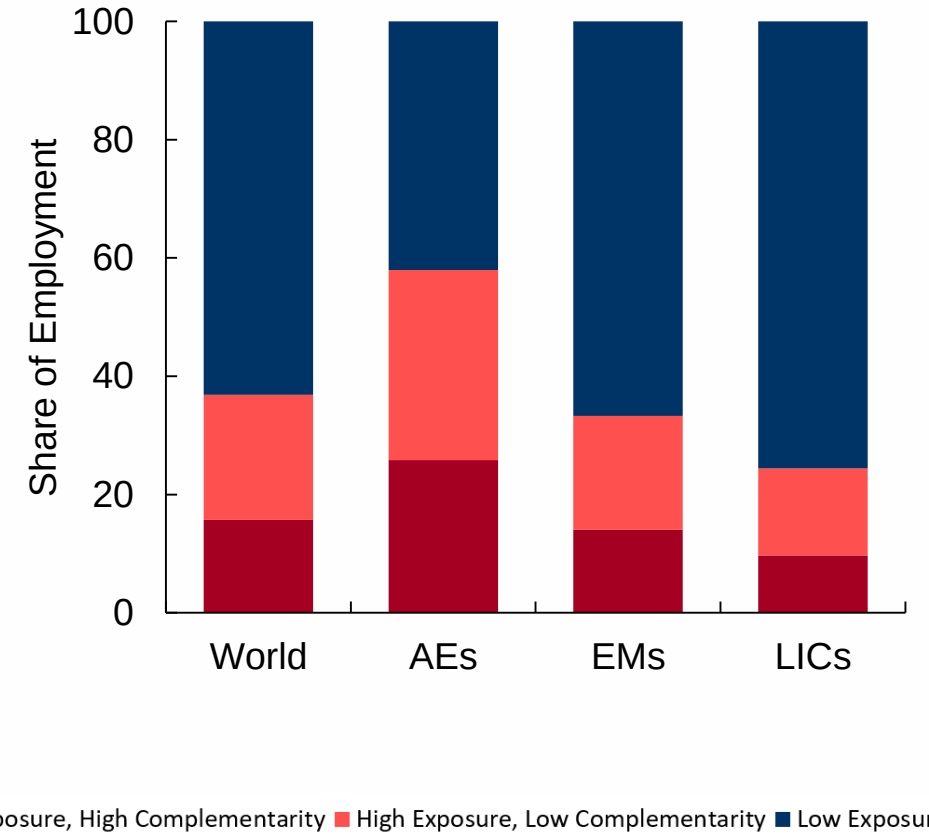
- Exposure: 40 percent worldwide and 60 percent in AE

- Exposure and complementarity by country income:
  - AEs:
    - 27 percent high-complementarity
    - 33 percent low complementarity jobs
  - EMs:
    - 16 percent high-complementarity
    - 24 percent low complementarity jobs
  - LICs:
    - 8 percent high-complementarity
    - 18percent low complementarity jobs

Employment Shares by AI Exposure and Complementarity



Exposure and complementarity

Definition and timeline

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- **Reallocation**
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- Differences across countries largely due to labor force composition in terms of occupational groups
- Exposure is higher for women and for more educated workers, but is mitigated by a higher potential for complementarity with AI
- Exposure is spread along the labor income distribution but potential gains from AI are positively correlated with income
- Reallocation is more difficult with age and less educated workers

Model-based analysis of AI's economic impact

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Labor market impact

- **Jobs at risks**
- **Reallocation**
- **Inequality**

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- **Task-based model** by **Rockall, Pizzinelli and Tavares** (2023) assesses effects on income distribution and wider economic impacts stemming from AI adoption

- Model incorporates differences in labor productivity, asset holdings, AI exposure, and complementarity

- Four channels of impact of AI are considered:
  1. Labor displacement
  2. Complementarity
  3. Productivity gains
  4. Capital income

- Calibration to the UK Economy

Model-based analysis of AI's economic impact II

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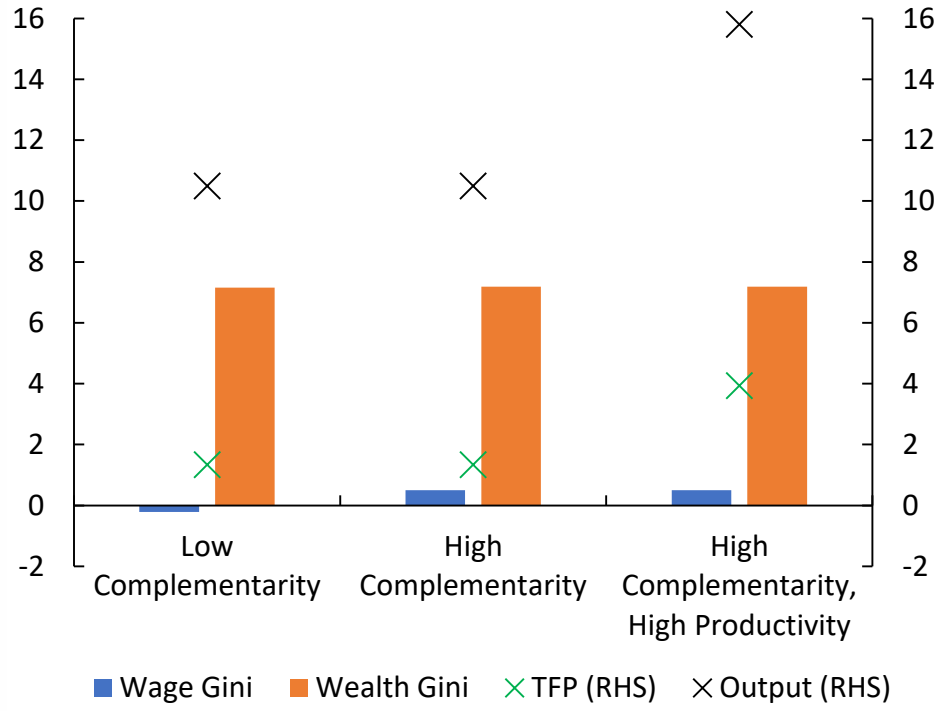
- **Scenario 1:** Low AI Complementarity
  - Output increases by nearly 10 percent
- **Scenario 2:** High AI Complementarity
  - Sectoral shift towards high-complementarity occupations
  - Income increase is like first scenario; wage inequality rises
- **Scenario 3*:*** High Productivity impact
  - Output increases by 16 percent
  - Income level rises for all workers

Impact on Aggregates

(Percentage Point on LHS; Percent on RHS)



Sources: IMF Staff calculations.
Note: The figure shows the change in the aggregate wage and wealth Gini between the initial and final distribution in each scenario, as well as the change TFP and output. For more details on the model see SDN Annex 4. TFP = total factor productivity.

Structural considerations

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- The current approaches to assess the effects of AI on labor markets use the concept of jobs as bundle of tasks

- Important caveat

  - The current approaches focus on the intensive margin (i.e. it takes sectoral structural as given). This is the first-round impact

  - Most action in the medium- and long-term is on the extensive margin (i.e. changes in the size of sectors)

René Magritte's 'Empire of Light' (1954)

Productivity: inherent uncertainty

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- Some productivity gains within industry (intensive margin)
- But most action will come from new sectors (extensive margin)
- The new sectors are difficult/ impossible to predict. Examples:
  - Internal combustion engines
  - Electricity
- So productivity gains …
  - … will take time
  - … depend on other enabling factors
  - with uncertainty
- Amara's law

Productivity: Framework

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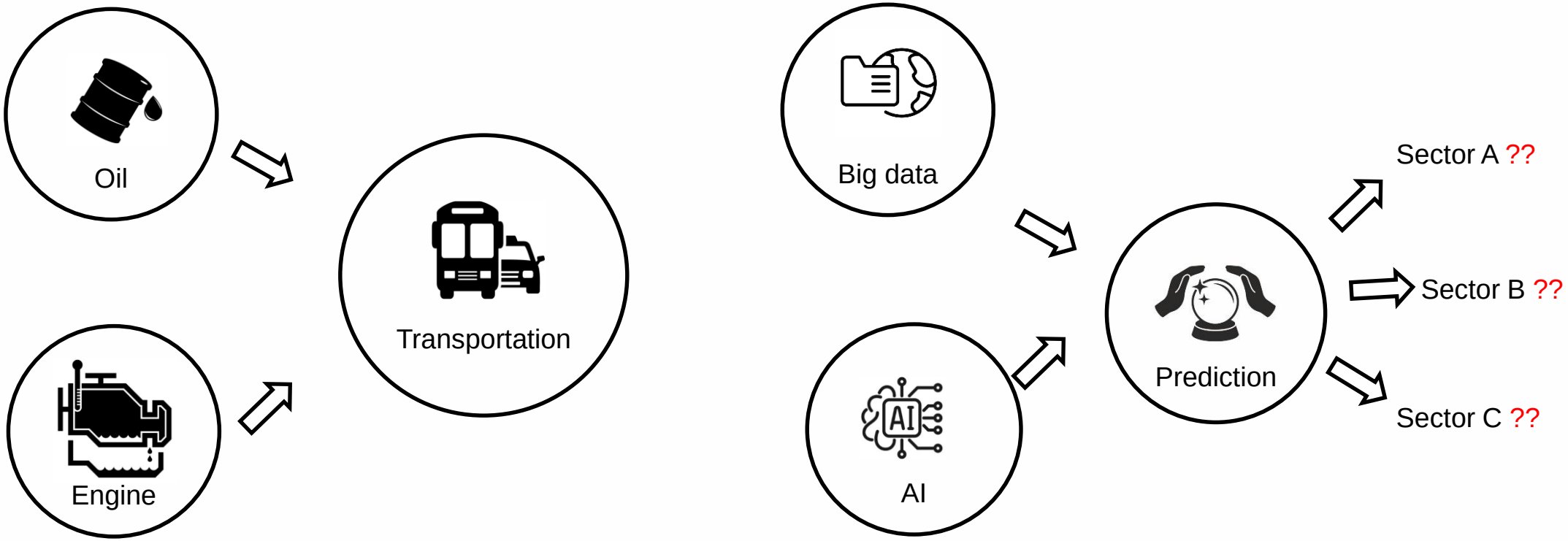

Productivity: old and new sectors

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Service industry: Calling centers

Medical diagnostic: Radiology

Financial markets: Credit card frauds / Credit worthiness

Public Administration: Detection of fiscal frauds

Hiring: CV analysis and candidate screenings

Weather forecast: Fertilizers

Market power and consumer surplus: Airline tickets vs. bananas

Central Banking: Forecasting

Productivity: Bottom line

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- Some TFP Growth from within sector
- Most TFP Growth from (impossible to predict) sectoral structural changes
- Historically, sectoral structural changes take time and require “enabling conditions”
- Political economy could be on the way of some changes
- Current estimates very dispersed and yet unreliable (parallel with IT revolution twenty years ago)

Who is benefitting now?

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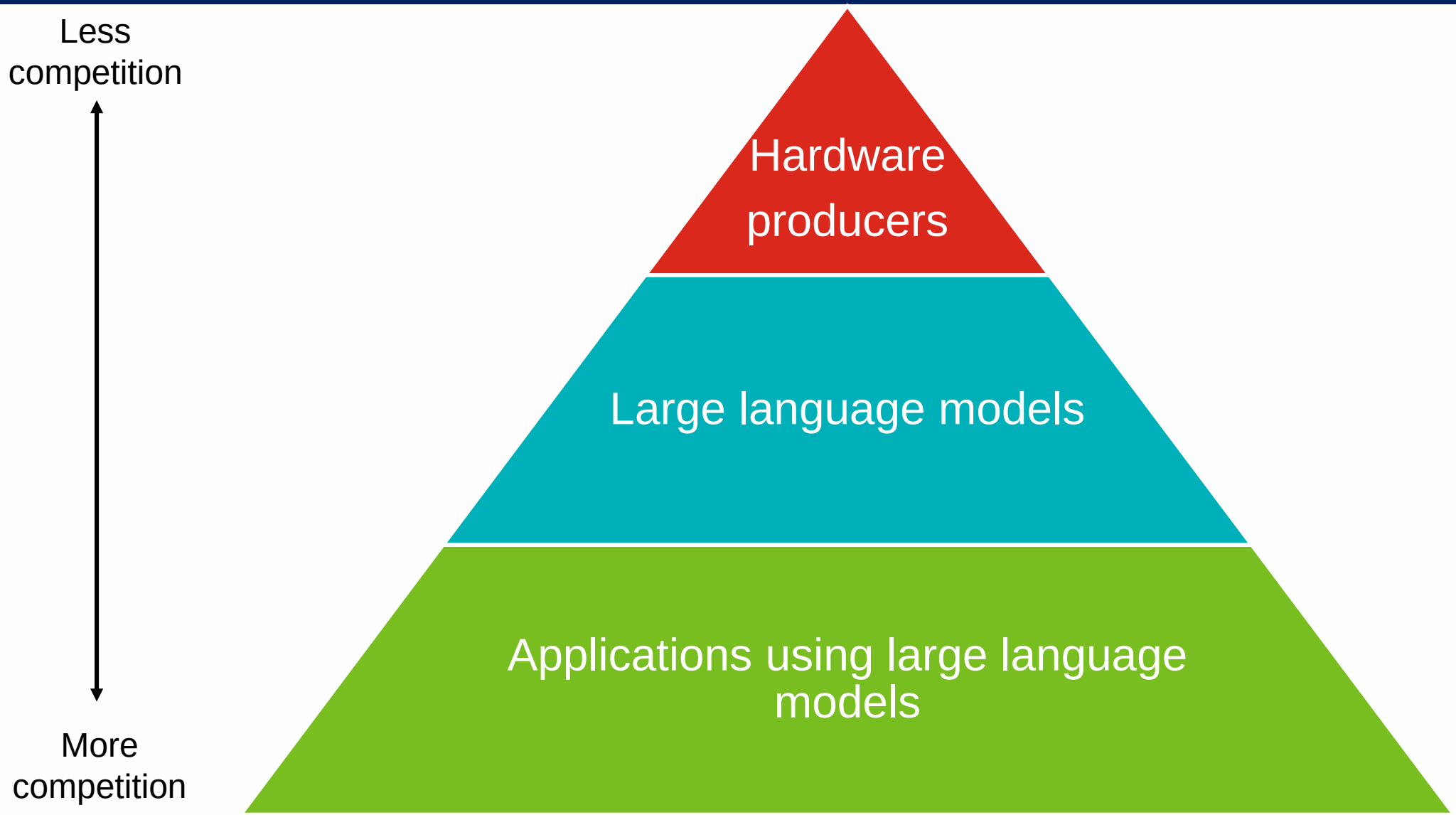

The Magnificent 7 in December 2024

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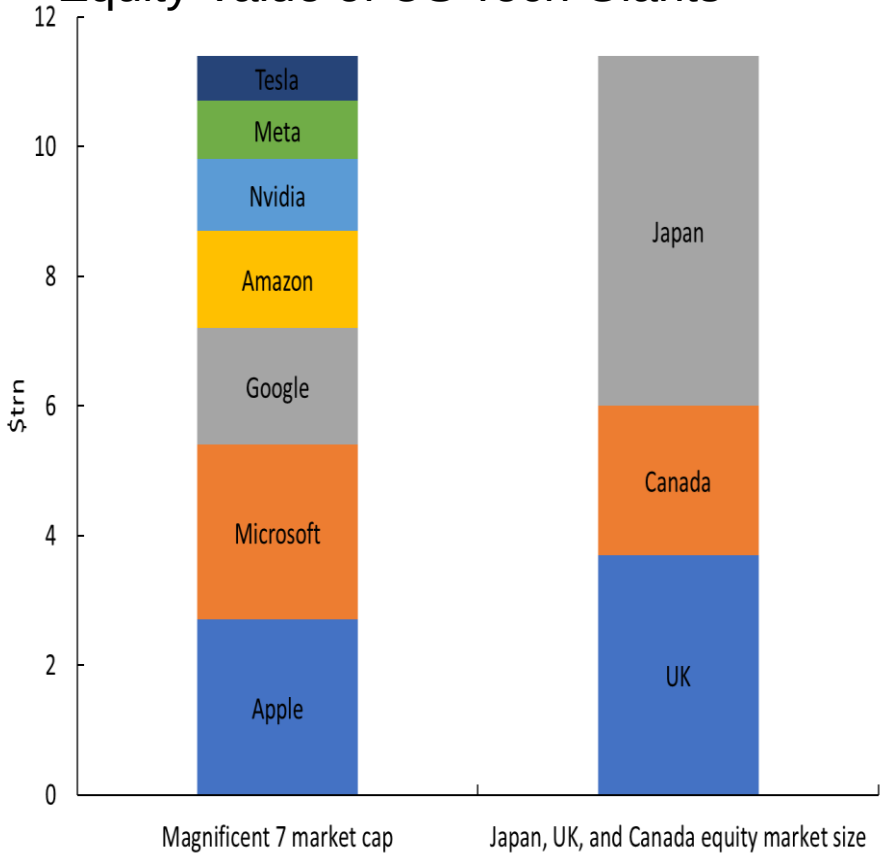
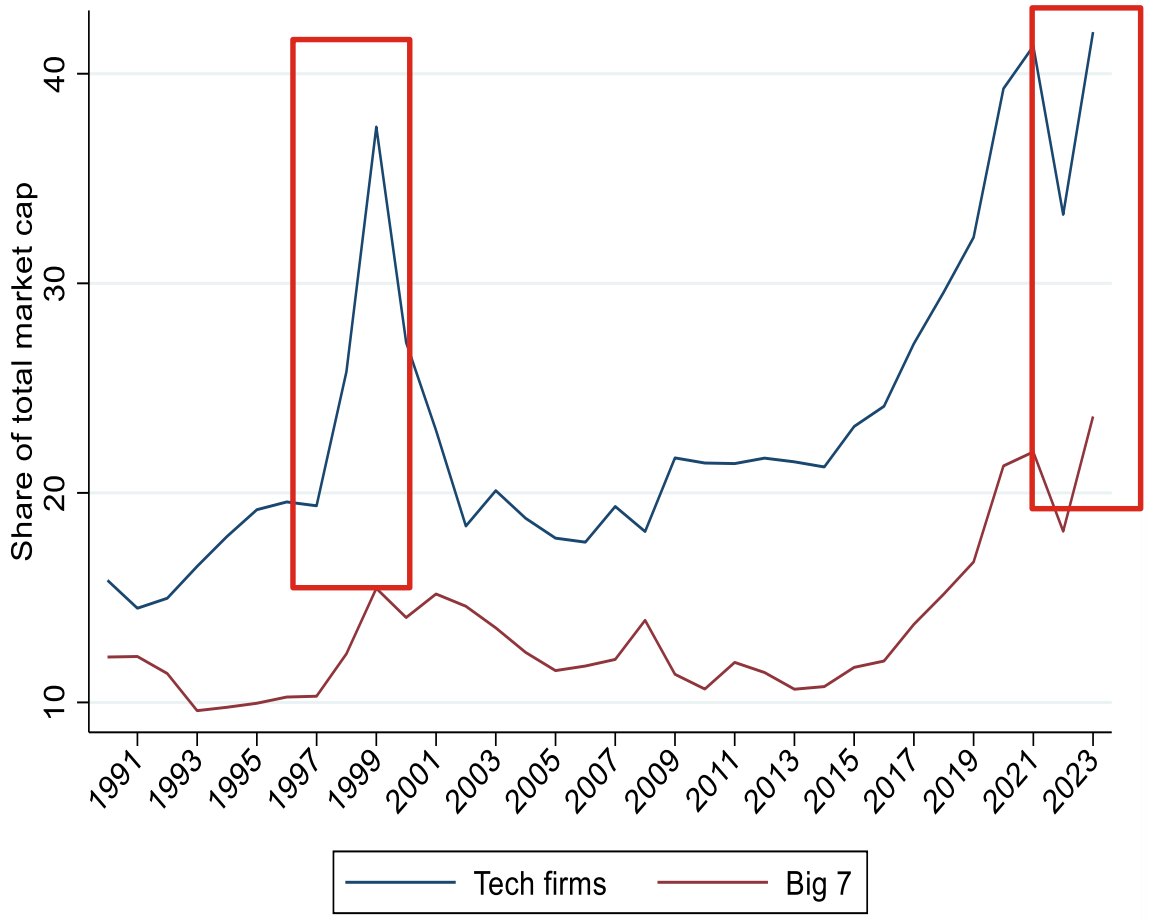
Equity Value of US Tech Giants



Market Concentration



Sources: CEIC, LSEG Worldscope Fundamentals, and IMF staff calculations

Plot 1 shows the market capitalization as of December 31, 2024, for the Magnificent 7 stocks and the four major equity markets. Plot 2 displays the share of total market capitalization in the US held by the 7 firms with the largest market value (i.e., the Big 7), as well as the share held by all tech firms. In recent years, the "Big 7" have all been tech firms and are commonly referred to as the Magnificent 7.

The Magnificent 7 in May 2025

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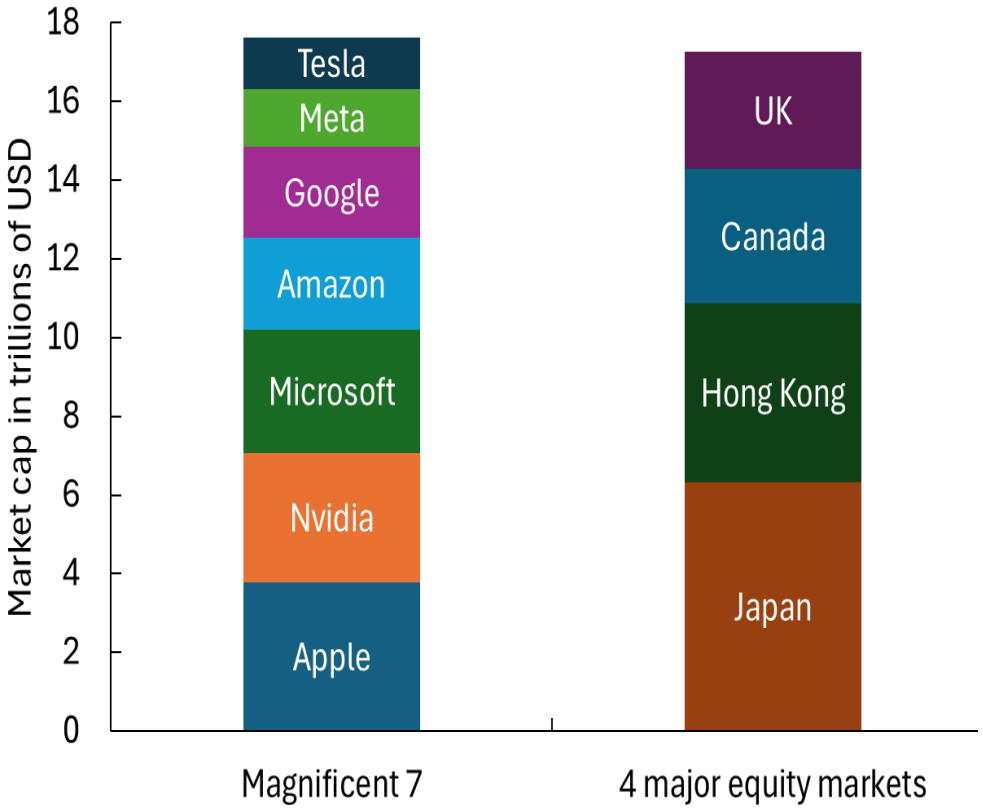
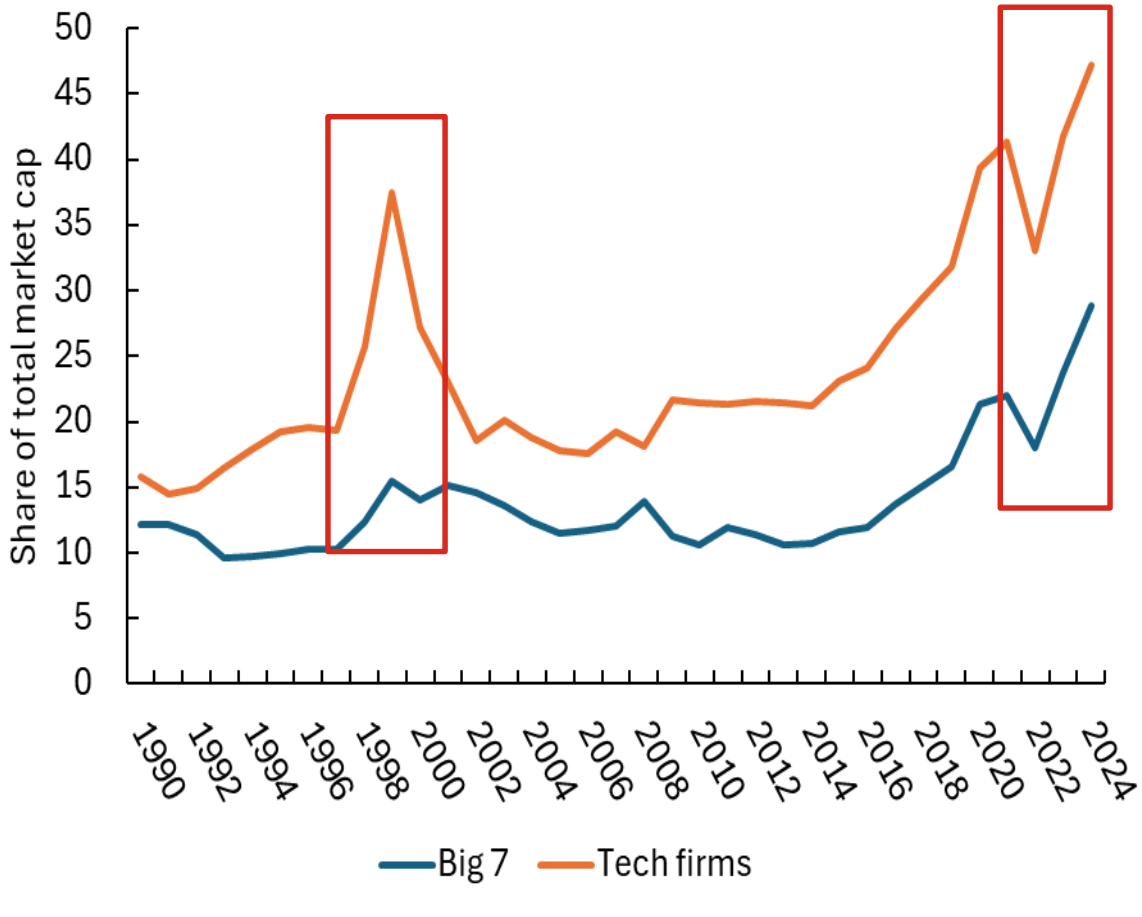
Equity Value of US Tech Giants



Market Concentration



Sources: CEIC, LSEG Worldscope Fundamentals, and IMF staff calculations

Plot 1 shows the market capitalization as of May 30, 2025, for the Magnificent 7 stocks and the 7 firms with the largest market value (i.e., the Big 7), as well as the share held by all tech firms. In recent years, the "Big 7" have all been tech firms and are commonly referred to as the Magnificent 7.

Domestic political economy vs international geopolitics

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- Domestically (workers and general public)
  - Key asymmetry: workers know the old jobs at risk, but nobody knows where new potential jobs will be
  - Workers currently at risk (intensive margin) >> workers who may benefit in the future (extensive margin)
  - Concerns about privacy / security

⇒ slowing down the development

- Domestically (Financial and AI sectors)
  - Financial and industrial interests

⇒ accelerating the development

- Internationally
  - AI is a dual-purpose technology (military and civilian) like nuclear or GPS

=> accelerating the development

- These opposite tendencies are reflected in the regulatory frameworks

A framework for regulation

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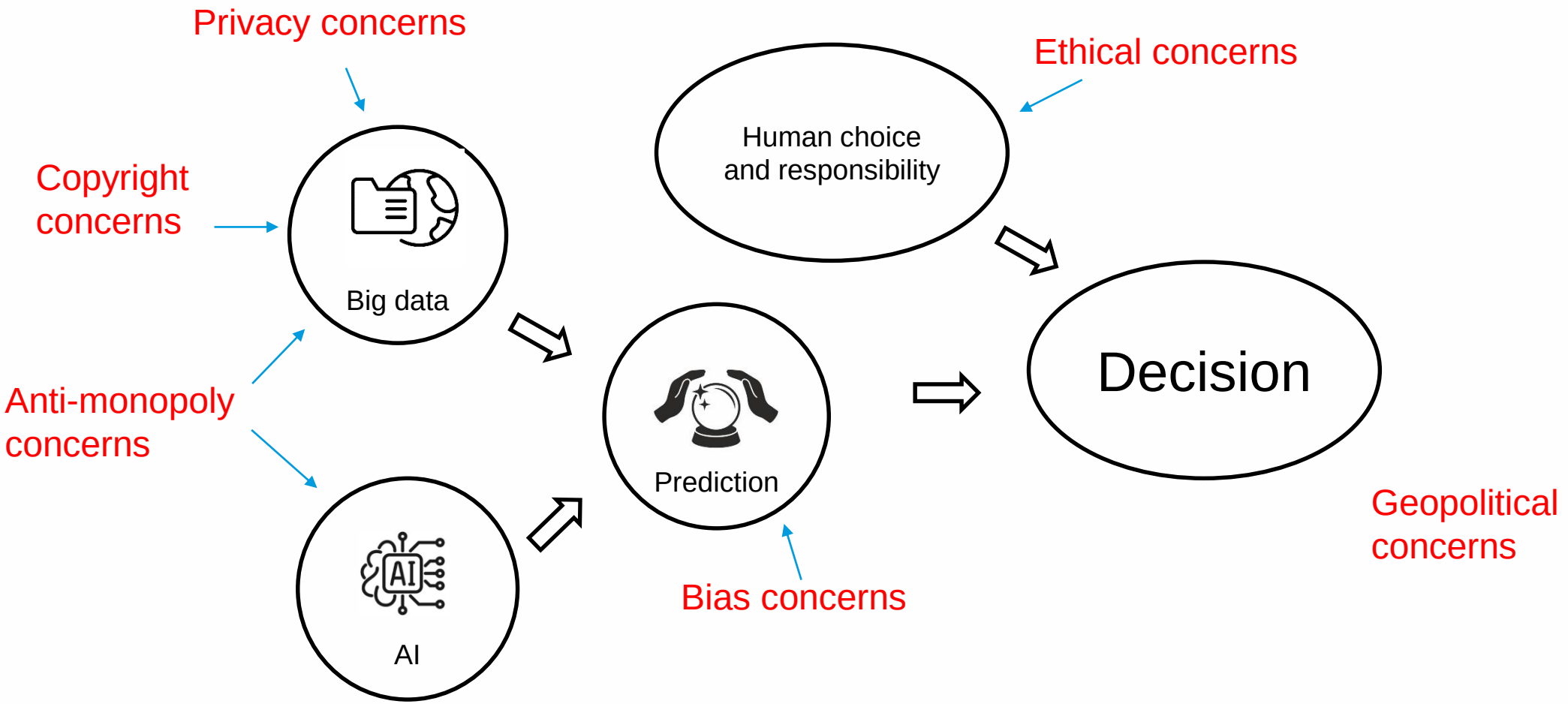

Higher-income economies, including AEs and some EMs, are generally better prepared than LICs to adopt AI

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- AI Preparedness Index measures readiness across multiple AI adoption areas
- Cross-country technology diffusion and adoption research (Keller, 2004; Nicoletti et al., 2020)
- Four dimensions:
  - Digital infrastructure: key for AI tech diffusion and application
  - Innovation and economic integration: promotes R&D and global trade, attracting investments
  - Human capital and labor market policies: digital skill distribution and policies for labor transitions
  - Regulation and legal: legal framework adaptability and governance enforcement

AI Preparedness Index and Employment Share in High-Exposure Occupations

Sources: International Labour Organization (ILO); and IMF staff calculations.
Note: The plot includes 125 countries: 32 AEs, 56 EMs, and 37 LICs. The red reference lines are derived from the median values of the AI preparedness index and high-exposure employment. Circles represent the average values for each respective country group. Crosses denote the average values for each corresponding country group AEs = advanced economics; EMs = emerging markets; LICs = low-income countries. Country labels use International Organization for Standardization (ISO) country codes.

Uneven impact across regions

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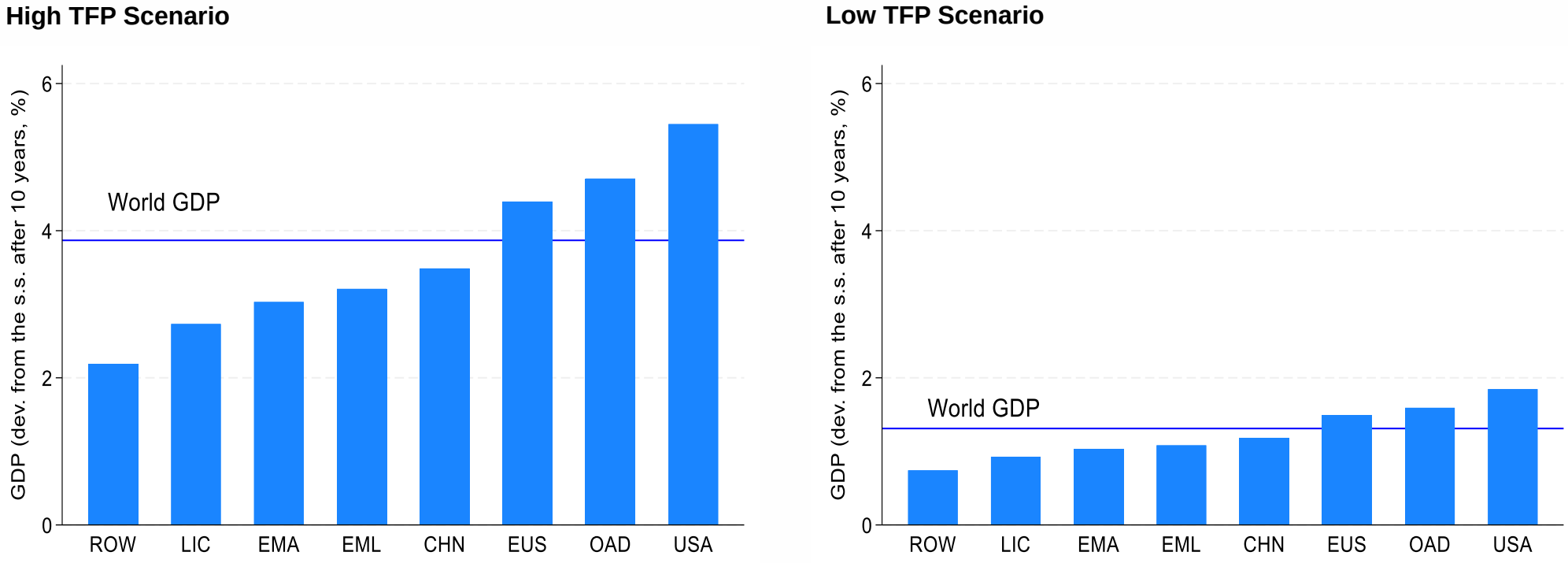
Cross-Country Differences in GDP in the Baseline Scenarios (10-Year Horizon)



Note: The left panel show the deviations of real GDP from the steady state for the high TFP growth baseline scenario after 10 years. The right panel show the deviations of real GDP from the steady state for the low TFP growth baseline scenario after 10 years. The global averages are shown as horizontal lines. EMA = Emerging Market Economies Asia, Central, Asia, Russia, etc. EML = Emerging Market Economies Latin America, Middle East, Africa, etc. EUS = EU and Switzerland, LIC = Low-income countries, OAD = Other advanced economies and ROW = Rest of the World. The detailed composition of the countries in each group is presented in Annex II.
Source: “The Global Impact of AI: Mind the Gap” by Eugenio Cerutti, Antonio Garcia Pascual, Yosuke Kido, Longji Li, Giovanni Melina, Marina M. Tavares, and Philippe Wingender

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- Large share of workers affected especially in AEs but many protected
- Implications for:
  - Income distribution
  - Political economy (domestic bias for status quo)
- Financial and economic power very concentrated. Also highly concentrated risks. (dot.com bubble on steroids!)
- Potentially important productivity gains depend on
  - Some within-sector gains
  - Mostly structural reallocation
  - Economic flexibility and social acceptability
- Regulation has multiple (and competing) goals
- Unequal preparedness
  - Readiness for technology
  - Economic, legal, and social flexibility
  - Human Capital