Photo credit: studiostoks/Shutterstock.

FISCAL AFFAIRS
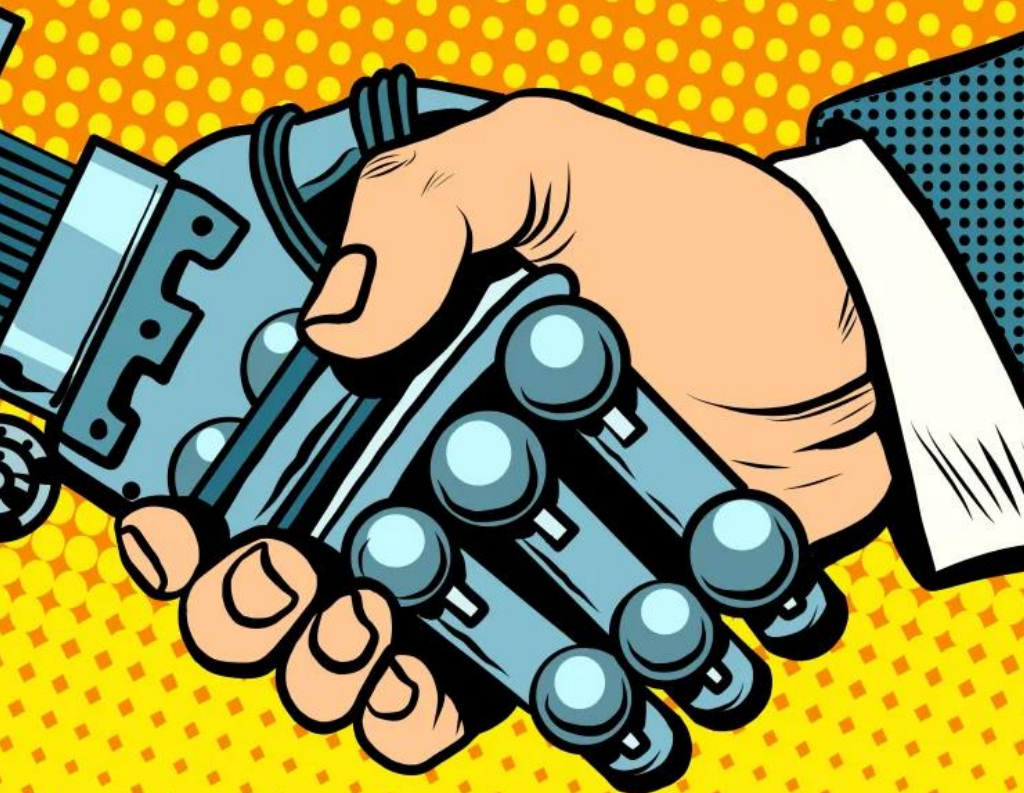
Fiscal Policies for the AI Transition

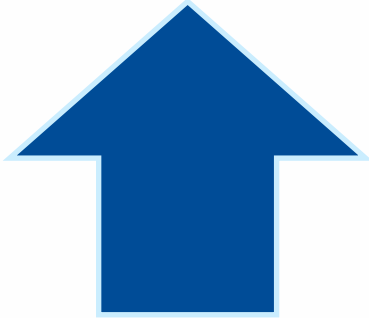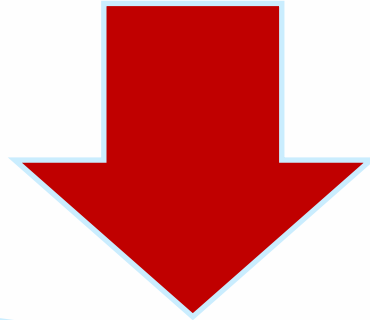**Era Dabla-Norris**

Deputy Director
Fiscal Affairs Department

How should fiscal policies harness the AI transition?

Potential to enhance productivity and public service delivery

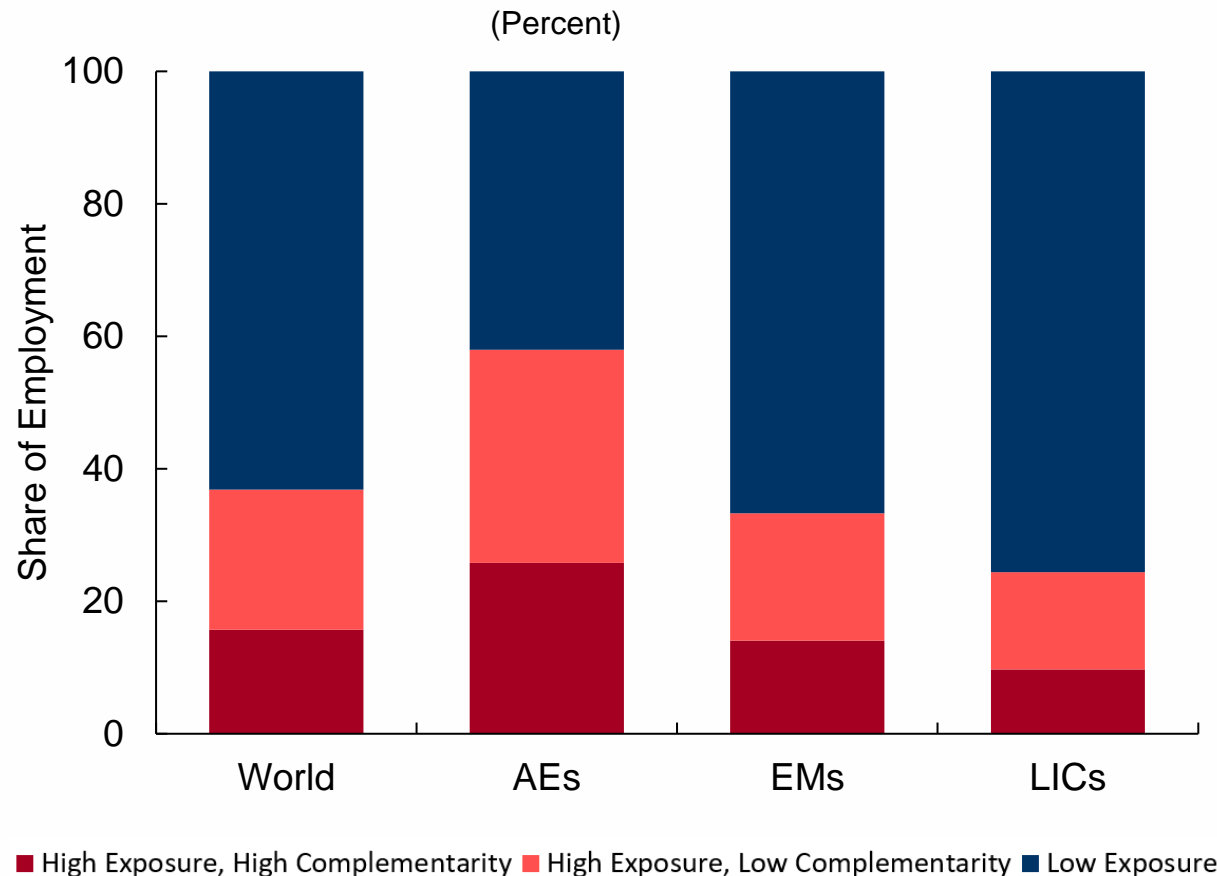Risk of massive labor disruption and rising inequality

Source: IMF Staff using DALL·E, OpenAI.

Question: How can policies steer AI to serve humanity best and cushion its negative effects?

About 40 percent of workers globally are highly exposed to AI

Employment Shares by AI Exposure and Complementarity

(Percent)

- AI exposure and complementarity varies by income group

- AEs dominate in cognitive-intensive roles, potentially facing more immediate AI job disruption.
  - ▶ But AEs also in stronger position to harness AI's growth potential.
  - ▶ Benefits within countries are likely to be unequally shared.

Legend: ■ High Exposure, High Complementarity ■ High Exposure, Low Complementarity ■ Low Exposure

Sources: Cazzaniga and others (2024), American Community Survey (ACS); Gran Encuesta Integrada de Hogares (GEIH); India Periodic Labour Force Survey (PLFS); International Labour Organization (ILO); Labour Market Dynamics in South Africa (LMDSA); Pesquisa Nacional por Amostra de Domicílios Contínua (PNADC); UK Labour Force Survey (LFS); and IMF staff calculations.
Note: Country labels use International Organization for Standardization (ISO) country codes. ISCO stands for International Standard Classification of Occupations. AEs = advanced economics; EMs = emerging markets; LICs = low-income countries; World = all countries in the sample. Share of employment within each country group is calculated as the working-age-population-weighted average.
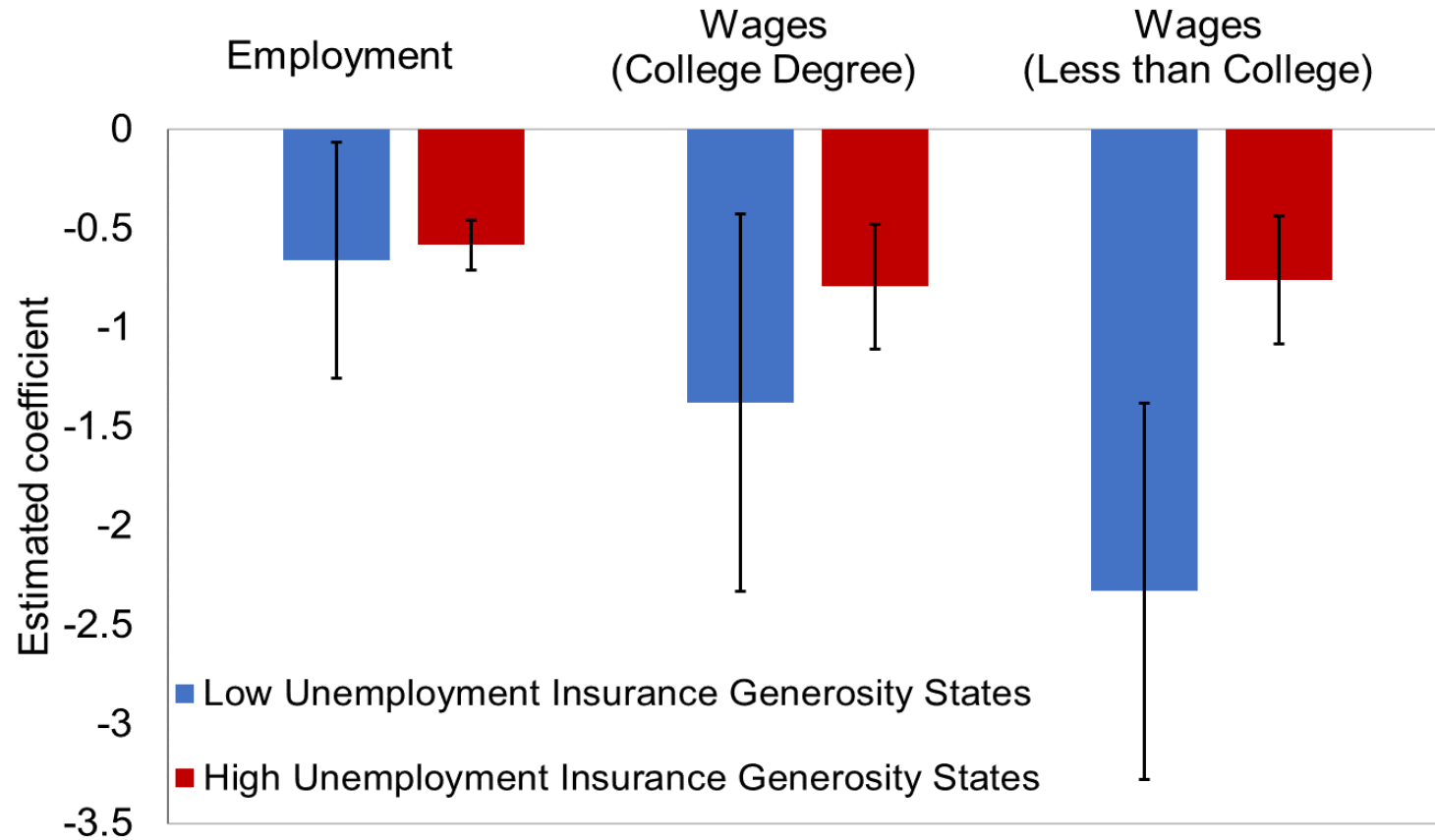
Roadmap

1. How have social protection systems helped reduce labor market disruption during past automation episodes?

2. How can countries strengthen social spending in face of disruptive transitions?

3. Do existing tax systems provide excessive incentives for automation?

4. Should automation be taxed to discourage labor displacement? How to design taxation in the face of inequality and winner-takes-all dynamics from Gen-AI?

Social Protection in Past Automation Waves

Social insurance mitigated the wage decline from automation...

Effect of Robotization on US Labor Market: Role of Unemployment Insurance
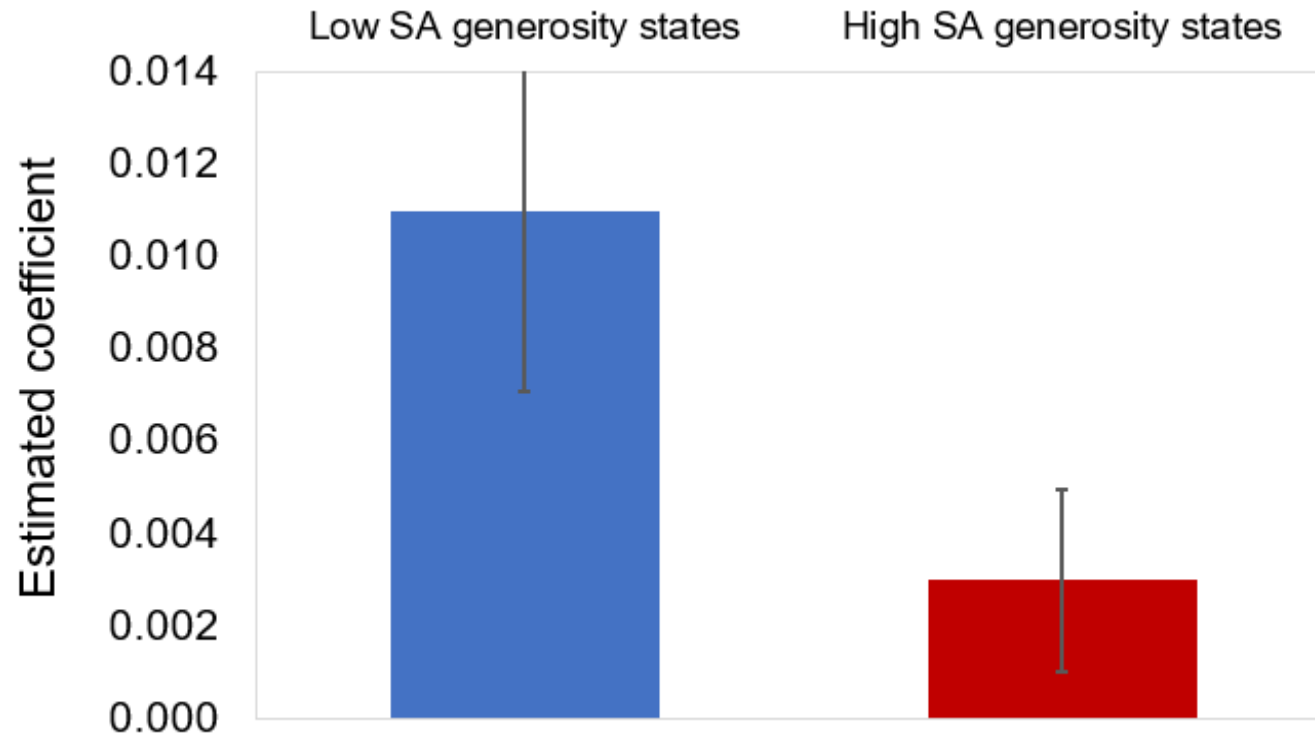(Employment-to-population and log hourly wages, percentage point change)

Source: IMF staff estimates, Acemoglu and Restrepo (2020), US Department of Labor.
Note: This figure presents estimates from instrumental variable regressions of employment and wages on robot adoption using cross-sectional data on U.S. commuting zones. The bars show the effect of robot adoption for commuting zones in states with high and low unemployment insurance generosity, separately. The generosity of UI benefits at the state level is measured as the product of the maximum legal benefit amount and its duration. Whiskers indicate 95-percent confidence intervals. See Brollo (2024) for details.

... and social assistance limited the increase in poverty

Effect of Robotization on Poverty: Role of Social Assistance
(Changes in poverty rates are expressed in differences 2000-2007)

Source: IMF staff estimates, Acemoglu and Restrepo (2020), US Department of Labor.
Note: This figure presents estimates from instrumental variable regressions of the poverty rate on robot adoption. The dependent variables are the change in the poverty ratio in a commuting zone over the sample period 2000-2007. Whiskers indicate 95-percent confidence intervals. See Brollo (2024) for details.

Upgrading Social Protection Systems in Face of Disruptive Transitions

Model: automation, unemployment, and fiscal policy

Extend a tractable HANK-DGSE model with labor market frictions (Ravn and Sterk 2021):
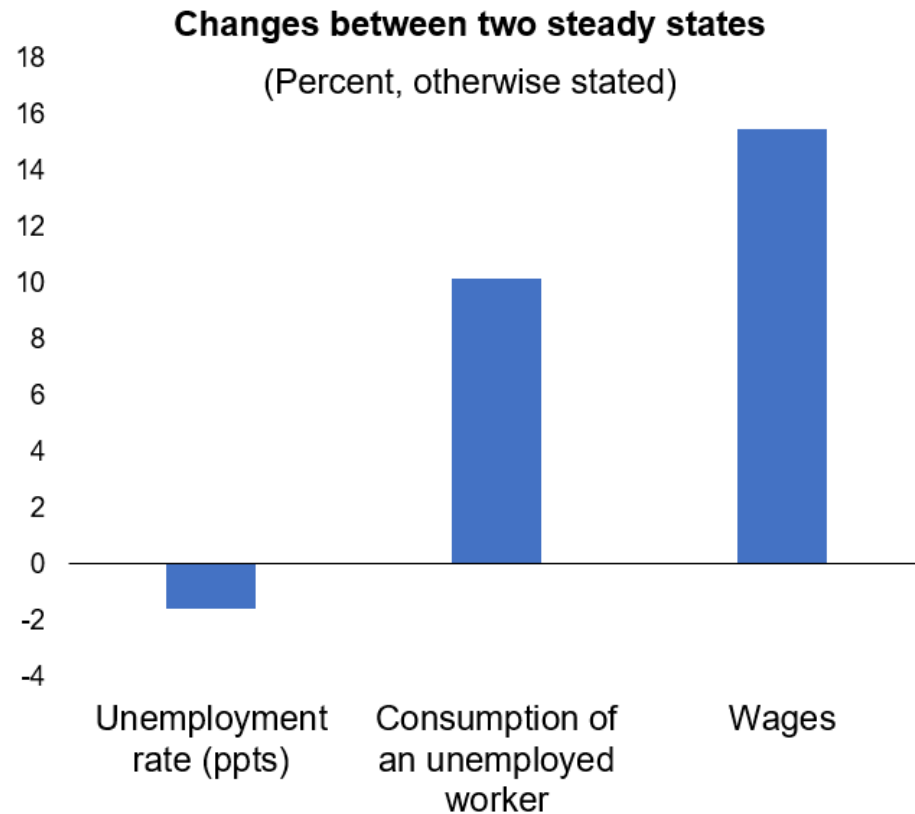
- **Two sectors, with potential for automation**:

  - each uses traditional capital, automated capital, and labor

  - automated capital can substitute for labor (Berg, Buffie, and Zanna 2018)

- **Labor market frictions**: endogenous employment via job search and matching frictions

- **Household heterogeneity**: 1) firm owners, 2) employed workers, and 3) unemployed workers

  - Workers face unemployment risk and are not fully insured, leading to precautionary saving

- Nominal rigidities and a Taylor-rule based interest rate

- **Different fiscal instruments**

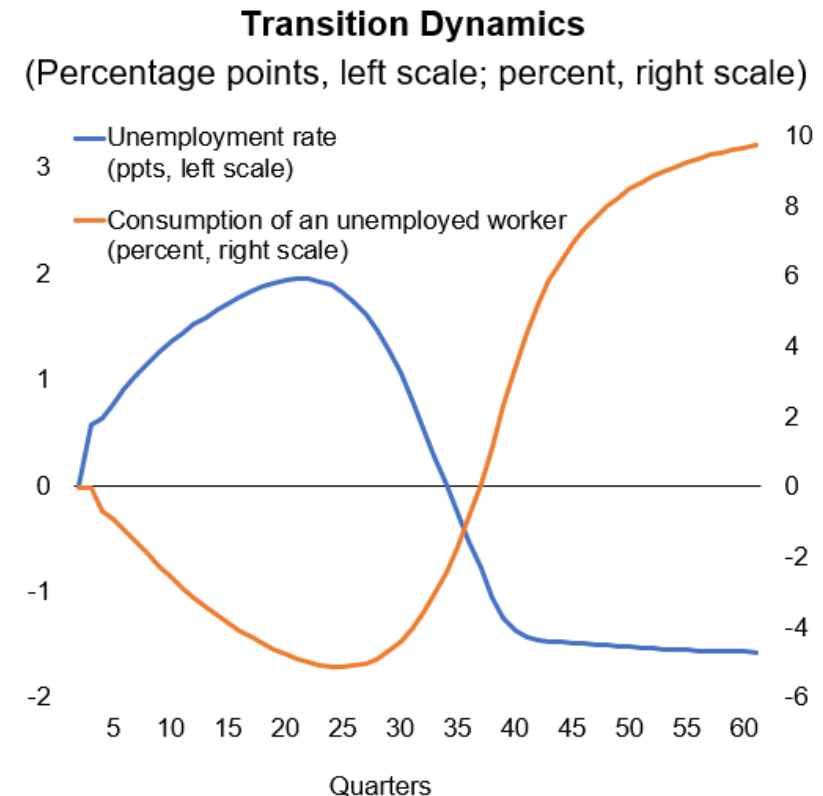# Scenario: sizeable automation in one sector over time

Resulting in a 20 percent fall in labor in affected sector in the new steady state (Mckinsey, 2023)

Automation can move economy to a better steady state…

…but unemployment rises in the transition due to skill mismatch, while consumption of poorest falls
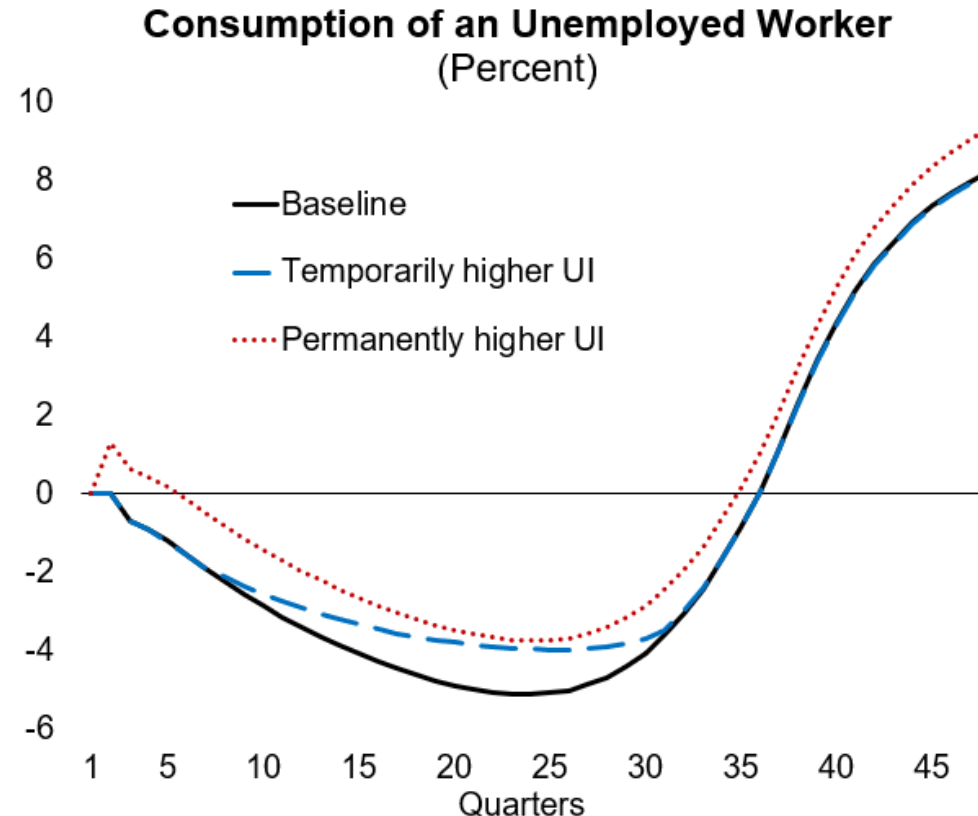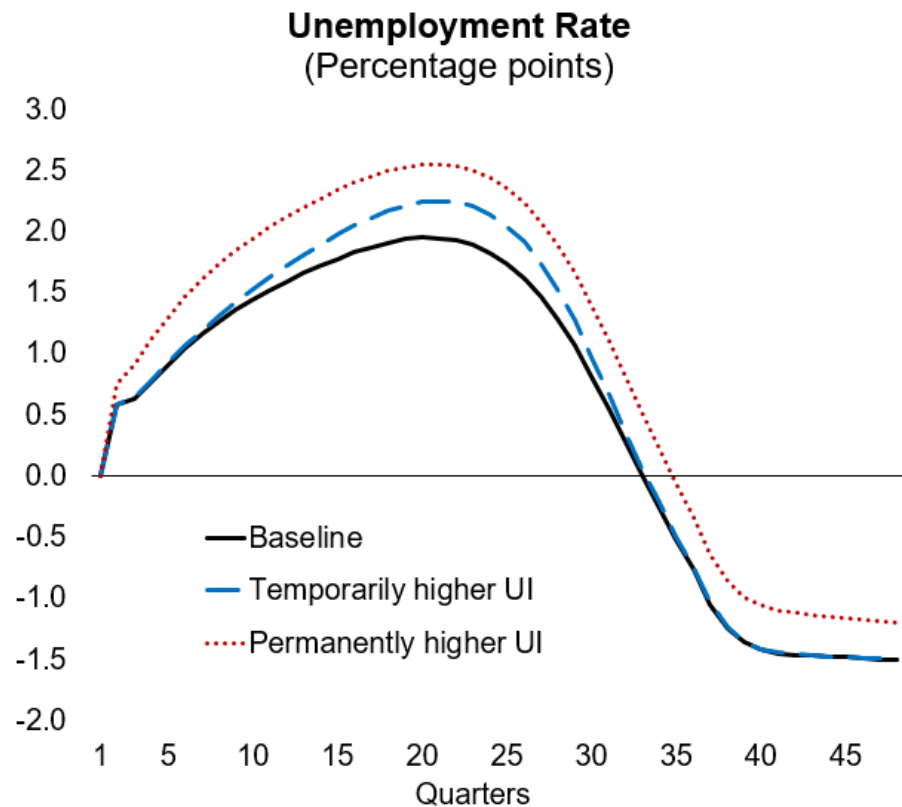

Source: IMF staff simulations.

Source: IMF staff simulations.
Notes: deviation from the initial steady state.

Strengthening unemployment insurance during the transition raises welfare

- Tradeoff between supporting income of the unemployed and incentivizing employment

- Temporary adjustment of replacement ratio (*rrat*) leads to higher welfare:

$$rrat_t = rrat + 0.6\,(ur_{t-1} - \overline{ur} - 1\%) \qquad \textbf{if } ur_{t-1} - \overline{ur} > 1\%$$

$$rrat_t = rrat \qquad \qquad \textbf{otherwise}$$

Unemployment Rate
(Percentage points)

- Baseline
- Temporarily higher UI
- Permanently higher UI

Consumption of an Unemployed Worker
(Percent)

- Baseline
- Temporarily higher UI
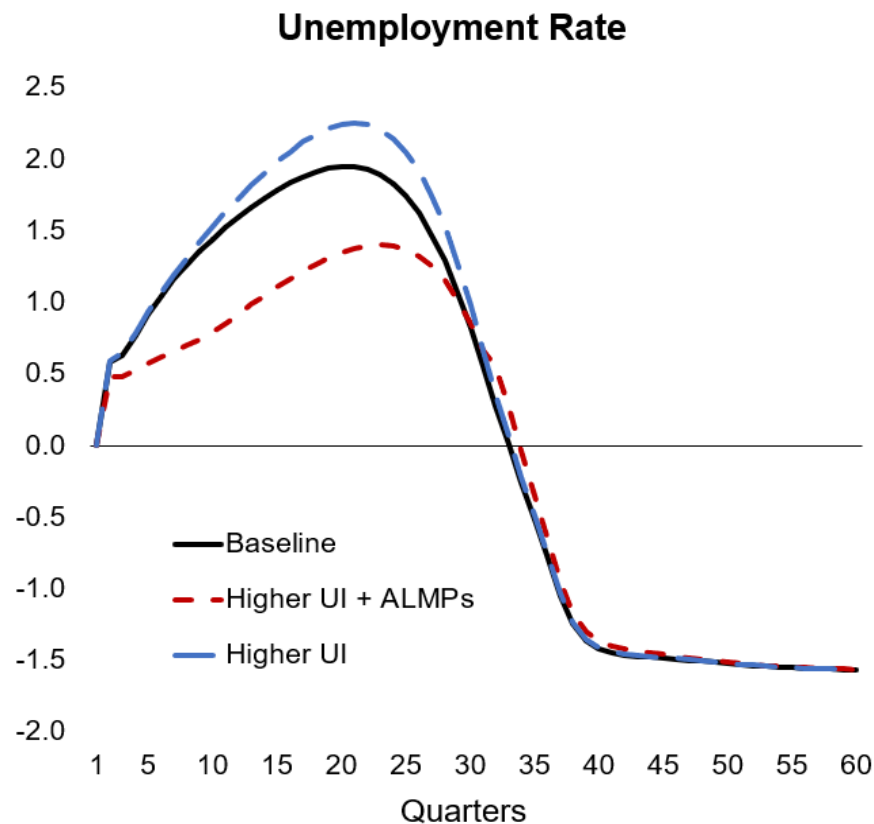- Permanently higher UI

Source: IMF staff simulations.

Notes: Figure shows the baseline simulation and two schemes of unemployment income support: a permanent increase in the replacement rate of 1 percentage point, and a temporary scheme attuned to the state of the economy. These policies are funded with labor income taxes, ensuring budget neutrality each period.

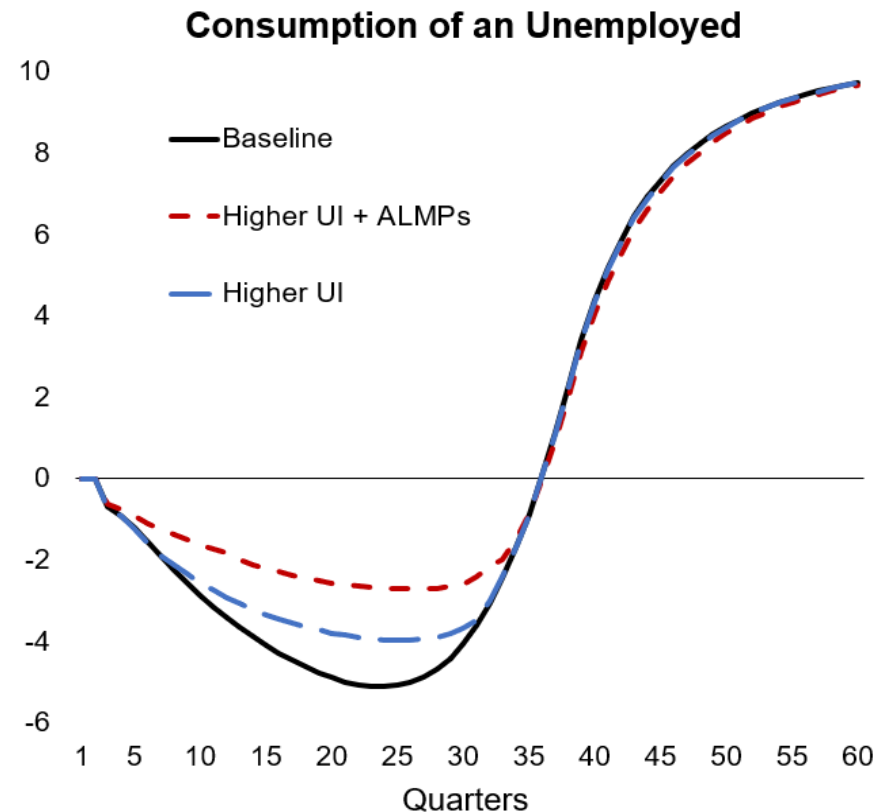# Active labor market policies significantly ease transition costs

Policy package including:

- Unemployment insurance with temporary adjustment

- ALMP: subsidizes half the hiring/training costs of firms during transition

1) Lowers surge in unemployment

Unemployment Rate

Legend:
- Baseline
- Higher UI + ALMPs
- Higher UI

X-axis: Quarters

2) Provides support to vulnerable unemployed workers

Consumption of an Unemployed

Legend:
- Baseline
- Higher UI + ALMPs
- Higher UI

X-axis: Quarters

Source: IMF staff simulations.

Notes: Figure presents the baseline scenario and two policy options: a temporary unemployment income support (UI) and a combination of UI and active labor market policies (ALMP). These policies are funded with labor income taxes, ensuring budget neutrality each period.

Current Tax Systems and Incentives for Automation

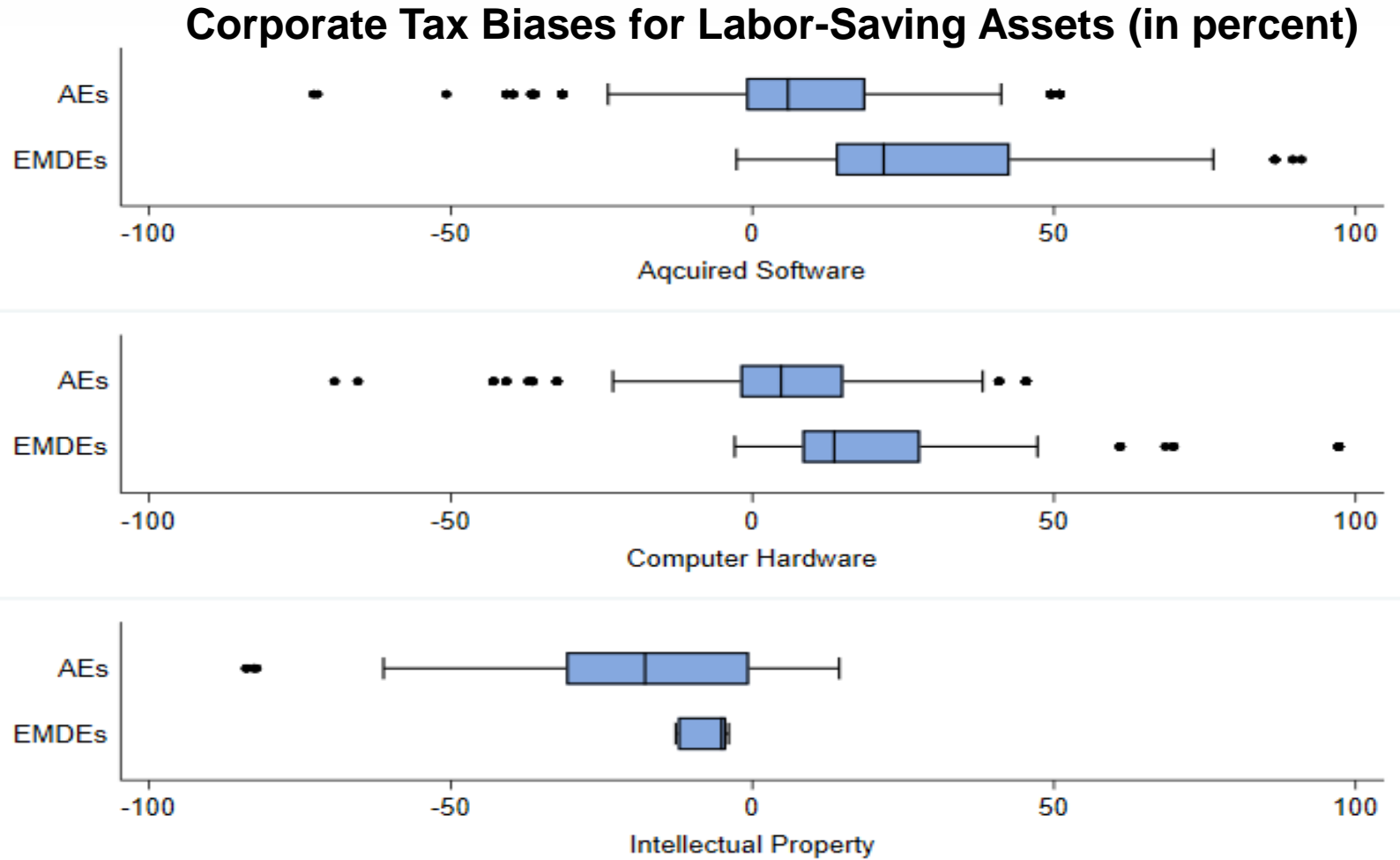# Existing tax systems differentiate between investment by asset category, ...

Corporate tax policies differentiate across broad asset categories

+

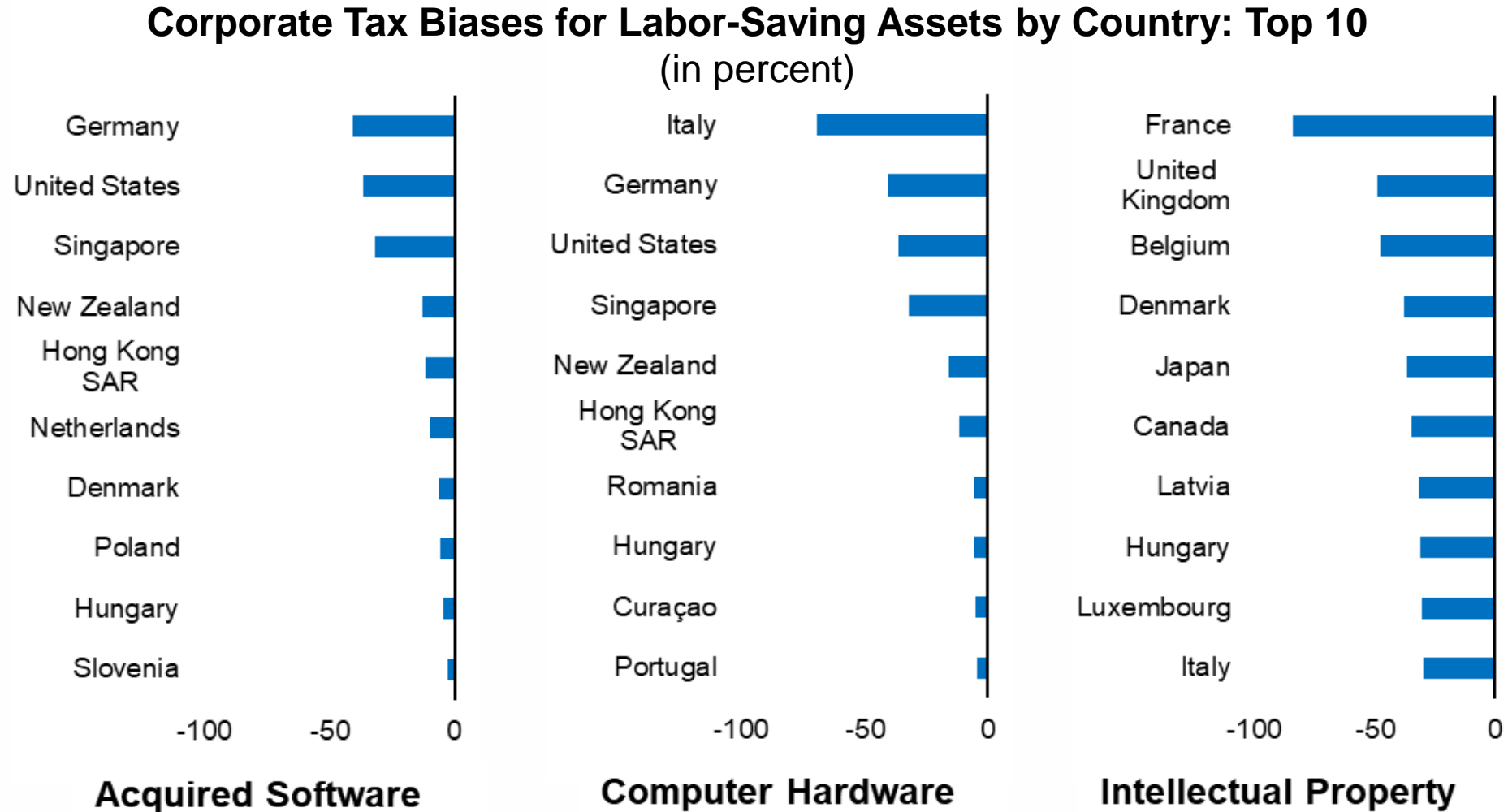Different assets vary in how they complement labor

⬇

Corporate tax biases for labor-saving assets

Corporate Tax Biases for Labor-Saving Assets (in percent)

Sources: IMF staff estimates and OECD Corporate Tax Statistics, 5th edition.
Note: Corporate tax biases for labor-saving assets, measured as the METR for acquired software and computer hardware relative to the METR for buildings, in 2017-2022; the METR for intellectual property are measured relative to the METR for buildings in 2017-2020. A positive value denotes a higher tax burden on the asset relative to buildings.

... favoring labor-saving investments in some countries

Corporate Tax Biases for Labor-Saving Assets by Country: Top 10
(in percent)

Acquired Software

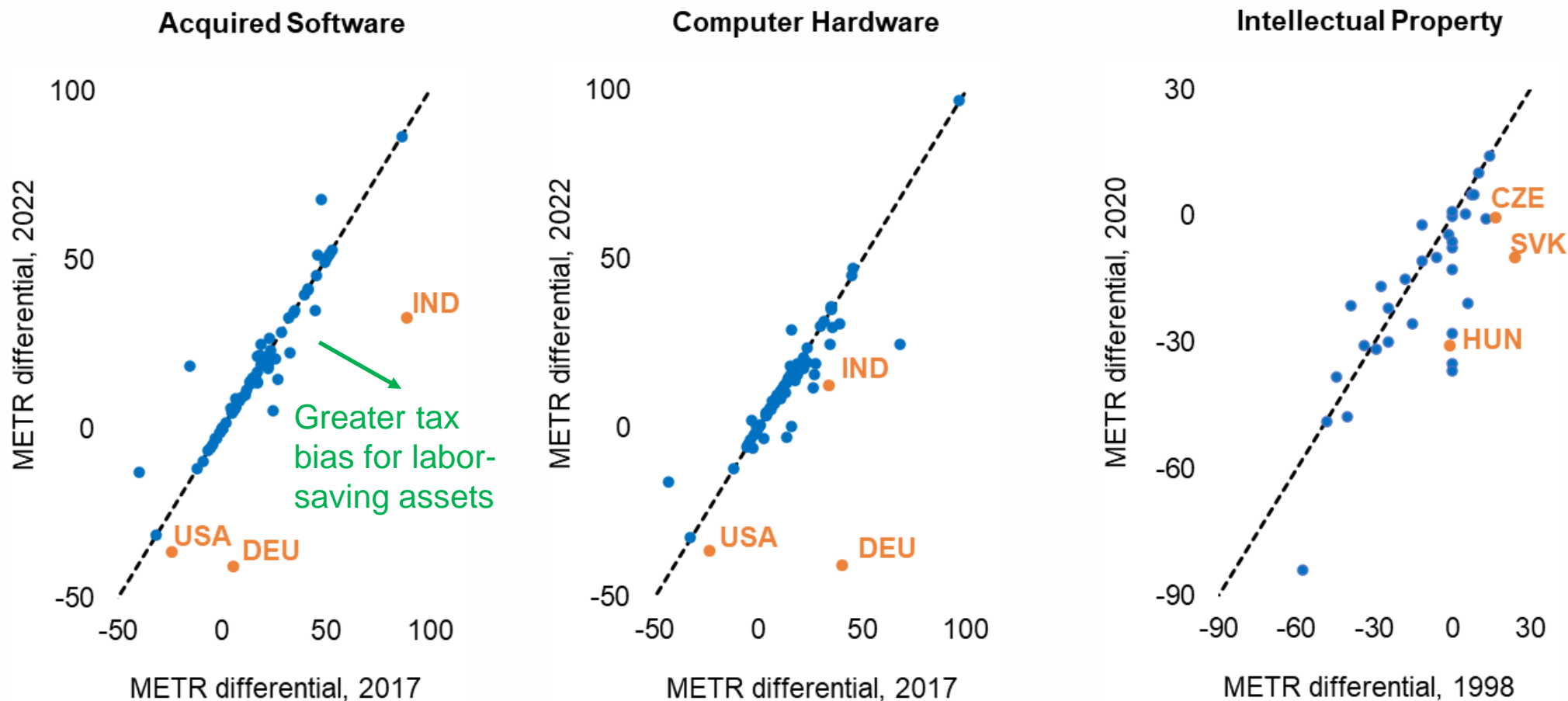**Computer Hardware**

Intellectual Property

Sources: IMF staff estimates, OECD, and ZEW.
Note: The top 10 countries with the largest corporate tax bias favoring labor-saving assets, measured as the METR for each asset type relative to the METR for buildings, for 85 countries in 2022 for acquired software and computer hardware; for intellectual property, the sample covers the EU-27 for 2020. A negative value denotes a lower METR on the asset relative to buildings.

Some countries have scaled up tax incentives for labor saving assets

Changing Corporate Tax Bias over Time

Acquired Software — METR differential, 2022 vs METR differential, 2017. Labeled points: IND, USA, DEU. Annotation: "Greater tax bias for labor-saving assets"

Computer Hardware — METR differential, 2022 vs METR differential, 2017. Labeled points: IND, USA, DEU.

Intellectual Property — METR differential, 2020 vs METR differential, 1998. Labeled points: CZE, SVK, HUN.

Sources: IMF staff estimates based on ZEW and OECD data.
Note: This figure plots the METR differentials for investments in intellectual property in 1998 against those in 2020, such that the diagonal corresponds to the case where the tax treatment relative to non-residential structures has not changed over time. METR differentials for acquired software and computer hardware compare 2017 to 2022.

Strengthening Tax Systems in Face of Disruptive Transitions

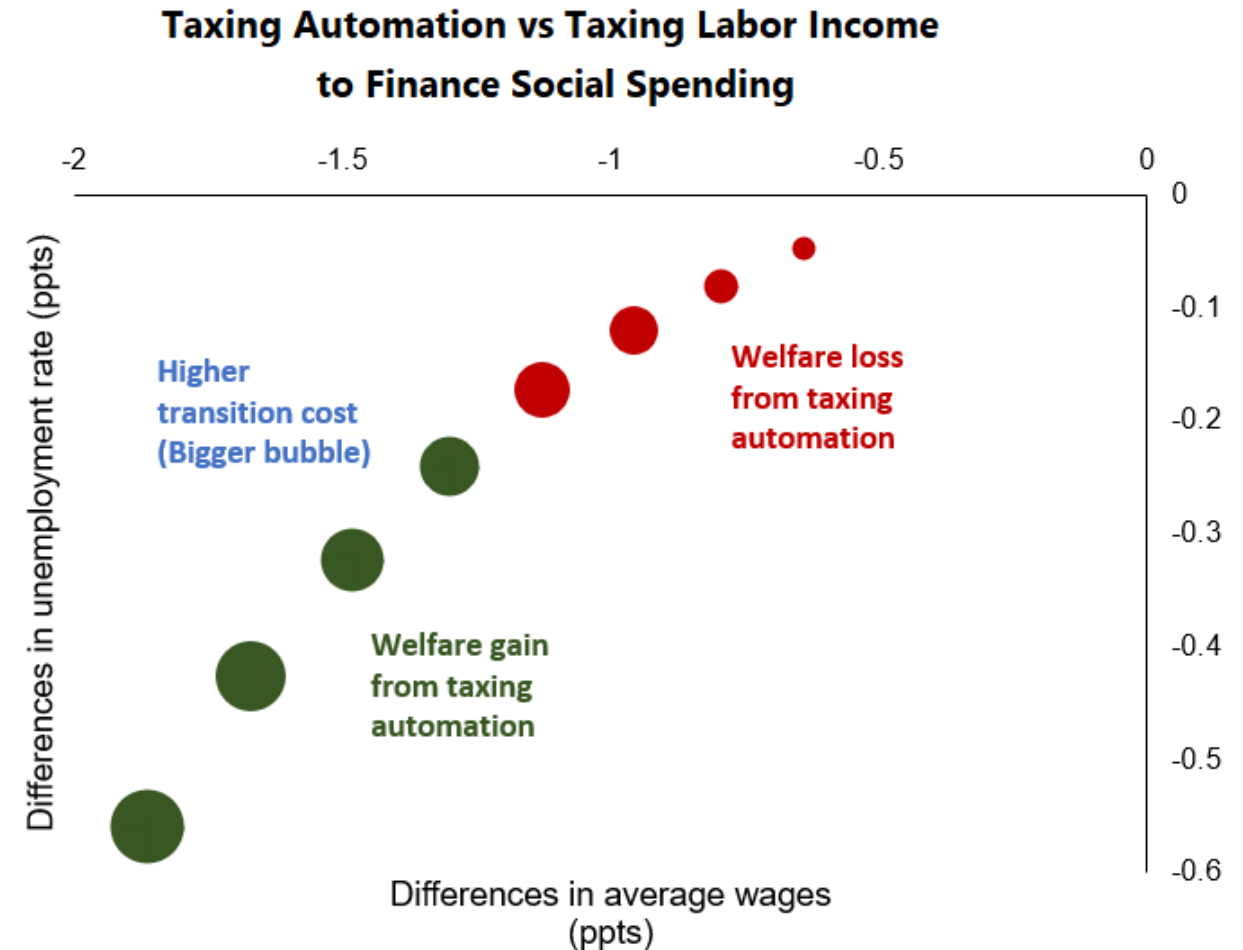# Taxing automation is optimal when labor disruption is high

How to finance social spending?

1. Taxing labor income

2. Taxing automation

→ Taxing automation raises welfare when labor adjustment costs high:

- *Efficiency* motive: firms do not internalize labor market and credit frictions.

- *Equity* motive: redistributes income from capital owners to workers.

→ But AI taxes difficult to implement in practice; need for higher tax on capital income?

Taxing Automation vs Taxing Labor Income to Finance Social Spending
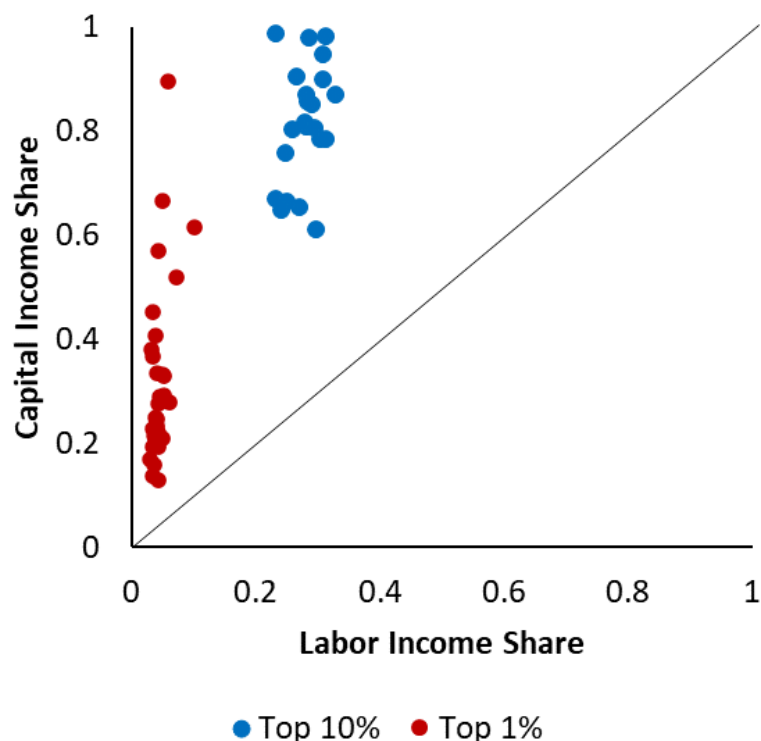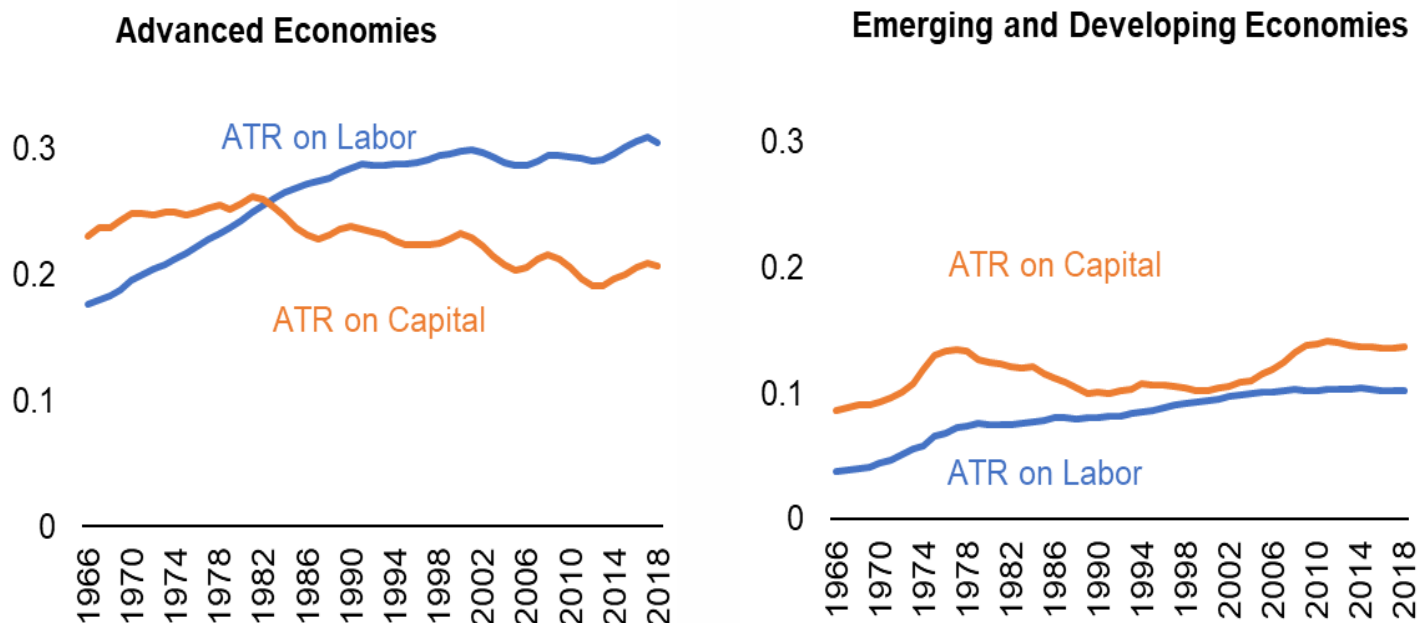

Source: IMF staff simulations.

Notes: Each bubble shows how shifting from a labor tax to an automation tax changes the response of average wages and the unemployment rate (averaged over 60 quarters). The different bubbles show how the results change with varying transition costs, with larger bubbles corresponding to larger costs.

Enhance taxation of capital income needed for equity and revenue

Concentration of Capital Income Among Top Earners: Cross-Country Evidence

Average Tax Rates (ATR) on Labor and Capital Income, 5-year Moving Average

Sources: Left: Luxembourg Income Survey and IMF staff calculations; Right: Bachas and others (2022) and IMF staff estimates
Note: Left: the income share held by the top 1 percent and the top 10 percent in labor and capital income in European countries. Right: ATRs are constructed by relating historical data on taxes paid to a measure of the tax base, based on a global macroeconomic data covering 1965-2018

Reverse the decline in capital income taxation

❑ **Strengthening the corporate income tax**, as the global minimum tax reduces tax competition pressure for all countries

❑ **Effectively taxing economic rents** in response to increased market power

❑ **Improving enforcement**, leveraging AI for more effective use of information and better capital income taxation

❑ **Enhancing capital gains taxation** to mitigate inequality

Takeaways

Broadening the Gains from Gen-AI: Role of Fiscal Policies

- Given high uncertainty about the impact of Gen-AI, policymakers need to adapt to changing conditions and **prepare for disruptive scenarios**.

- Improve generosity and coverage of **unemployment insurance** during AI transition.

- Strengthen social safety nets for workers facing potential long-term unemployment.

  ➢ Integrate unemployment insurance with **ALMPs**. Reform education and training policies.

- Avoid excessive tax incentives for labor-displacing automation.

- Strengthen **capital income taxation.**

Extra Slides

Model Infographic