# Inflation and Monetary Policy During the Pandemic Recovery

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# Outline

1. **Provide an overview of the pandemic period and how it compares with pre-Covid recessions.**

2. **Present stylized facts about the global inflation surge, and the implications for sectoral Phillips curves.**

3. **Show that these features can emerge endogenously in macro models, and that the sectoral dimension is key.**

4. **Describe the monetary policy response.**

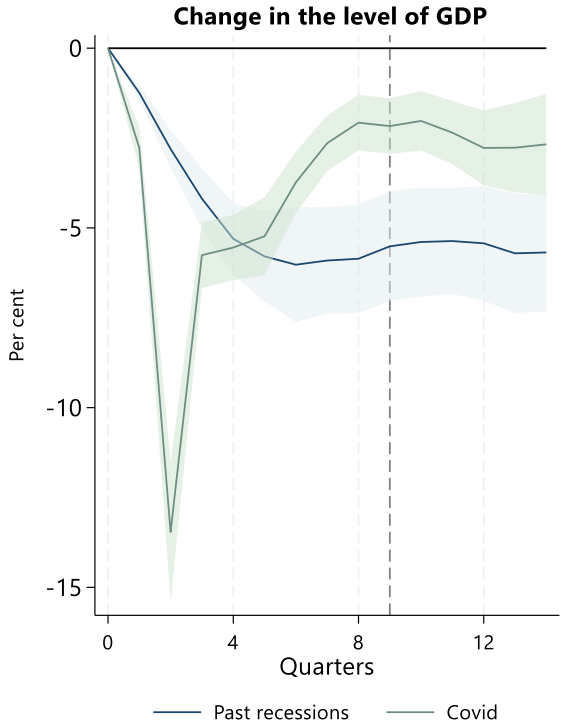
5. **Discuss implications of changes in Phillips curve for monetary policy.**

Draws on Gudmundsson et al (2024) and Chapter 2 of IMF Fall 2024 WEO.

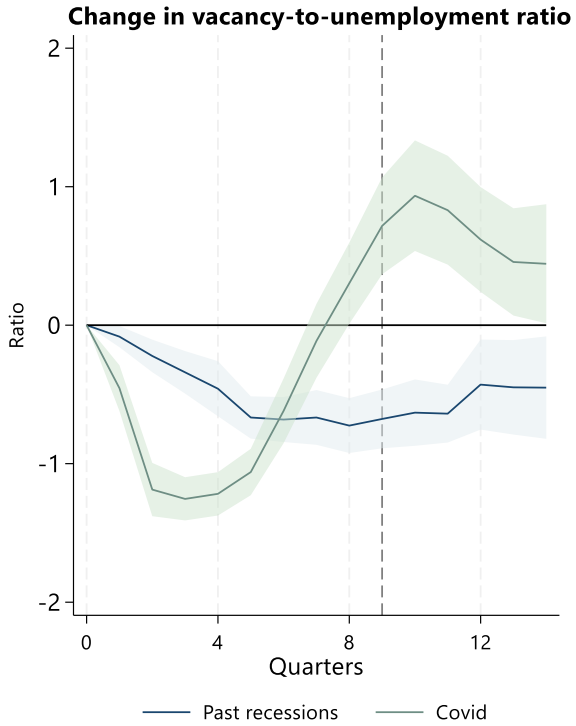
# Activity and Inflation during the Pandemic Recovery

# The pandemic recovery was rapid, unbalanced, constrained, and with limited slack

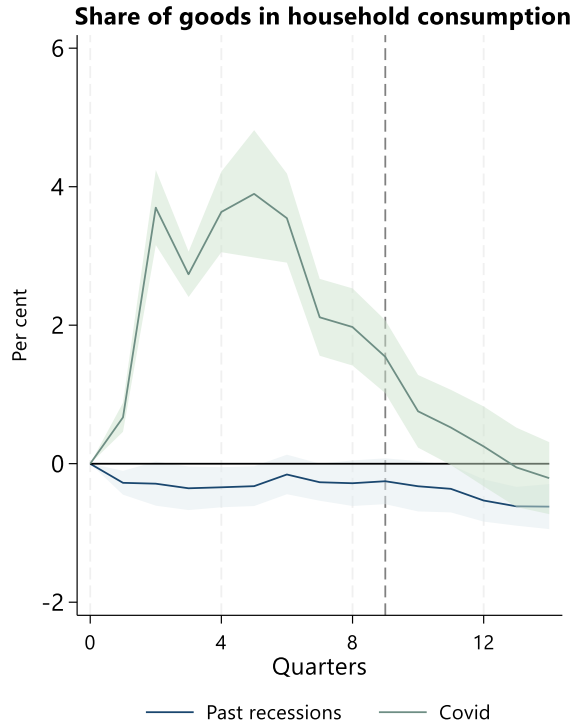
## Rapid but incomplete recovery



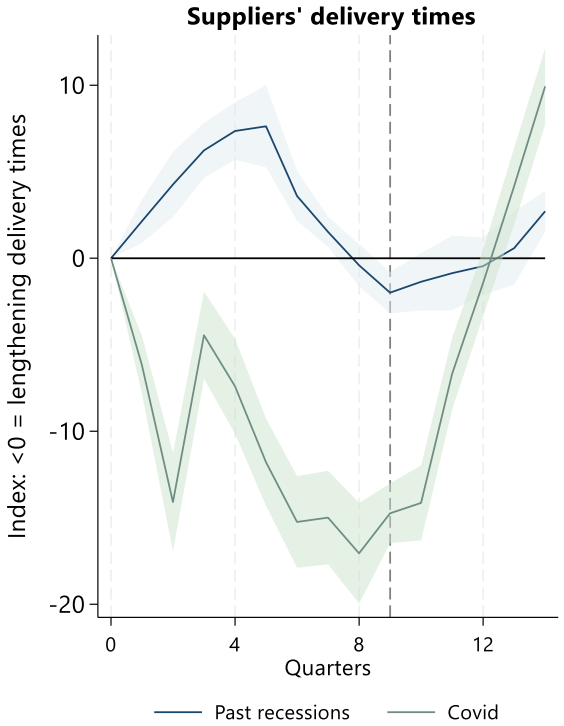

## Limited labor market slack




## Rotation towards goods




## Large supply constraints



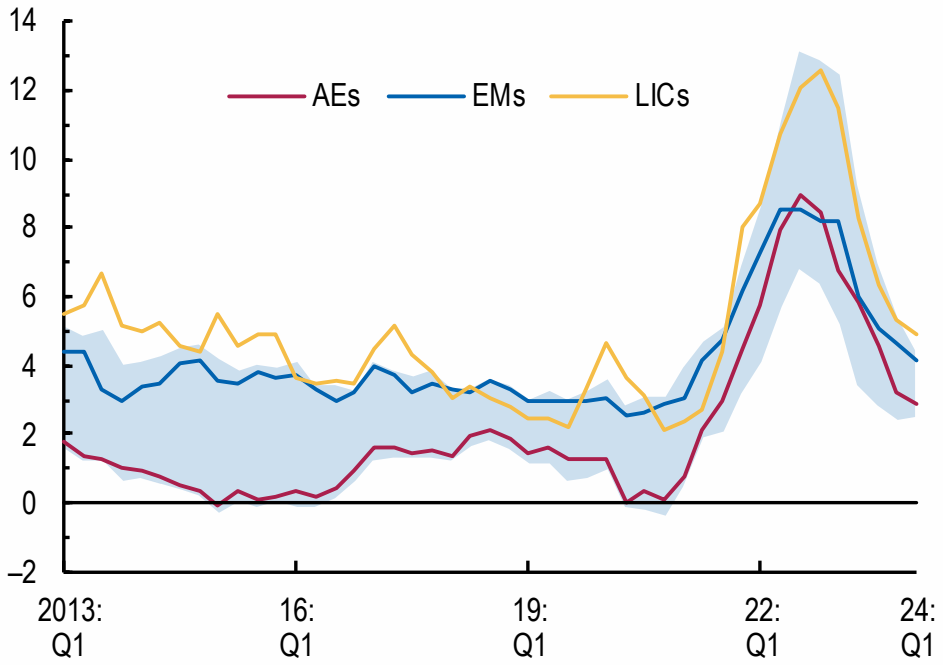

Source: Haver, OECD, IMF staff calculations
Note: Sample includes AEs within the OECD from 1990-2023Q1. Shaded areas represent 90% confidence interval.
Vertical line denotes the start of Russia's war in Ukraine

- Use local projections to estimate average impact on key variables of (i) recessions and (ii) start of Covid (2020Q1). Sample of 25 AEs from 1990-2023.

# The recovery led to a global and unexpected inflation surge

## Global Inflation

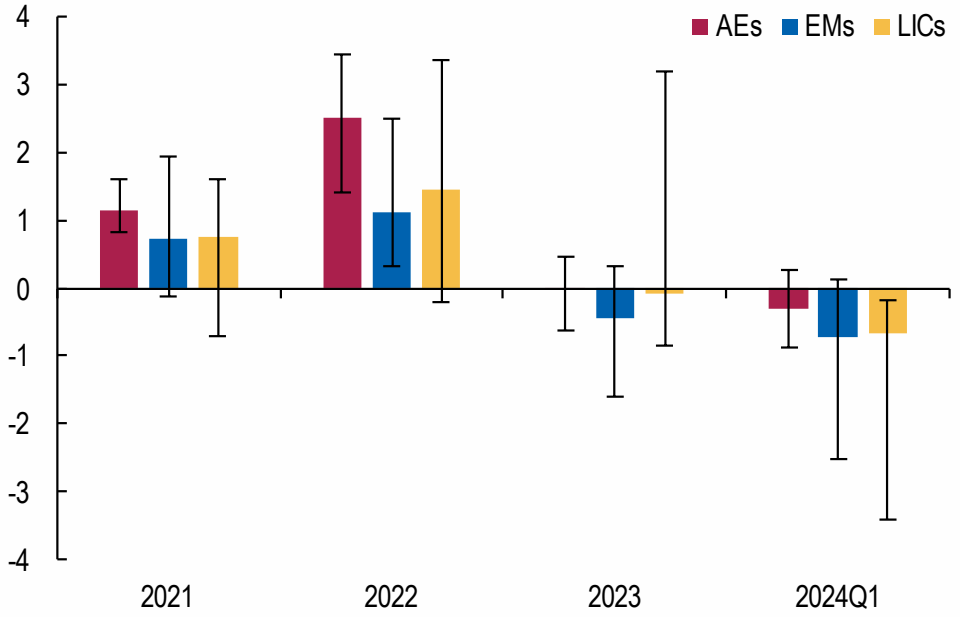
*(Percent, year-over-year, SAAR)*




Sources: WEO; and IMF Staff calculations.
Note: Lines are the median of consumer price index (CPI) inflation within each analytical group. The band depicts the 25th to 75th percentiles of data across economies. AEs = advanced economies; EMs = emerging market economies; LICs = low-income countries; SAAR = seasonally adjusted annual rates.

## Inflation Forecast Errors

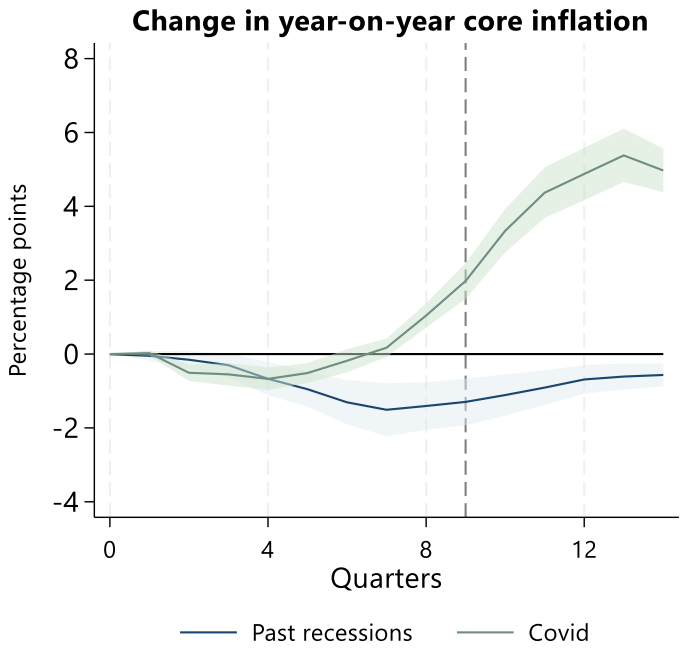
*(Median, year-over-year percent change)*



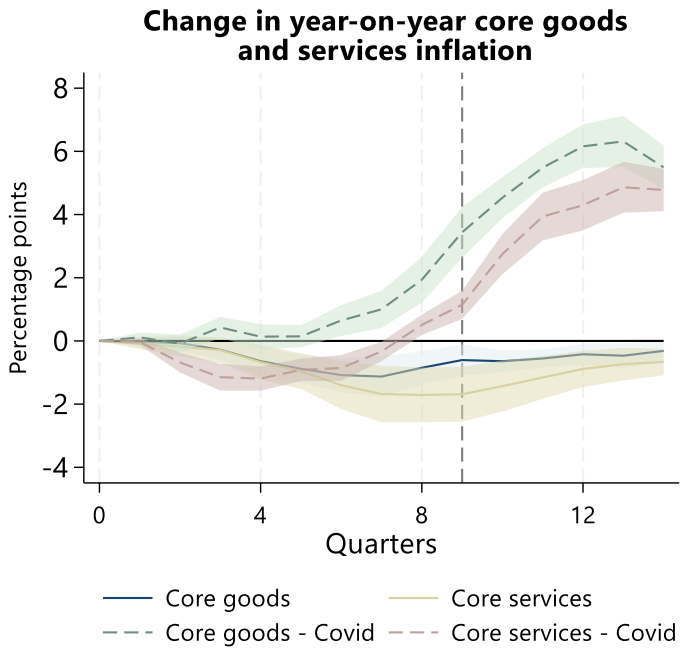

Sources: WEO; and IMF staff calculations.
Note: Forecast errors are derived by comparing one-year ahead CPI inflation forecasts to actual figures in each year's April WEO. The actual values for a given year t are taken from the April WEO in the following year (t + 1). The bars represent median inflation rates, and the whiskers extend from the 25th to the 75th percentiles of data across economies. The data for 2024Q1 are annualized year-over-year percent changes, with a limited country sample due to quarterly data availability. AEs = advanced economies; EMs = emerging market economies; LICs = low-income countries..

# The inflation surge featured stark sectoral price dynamics

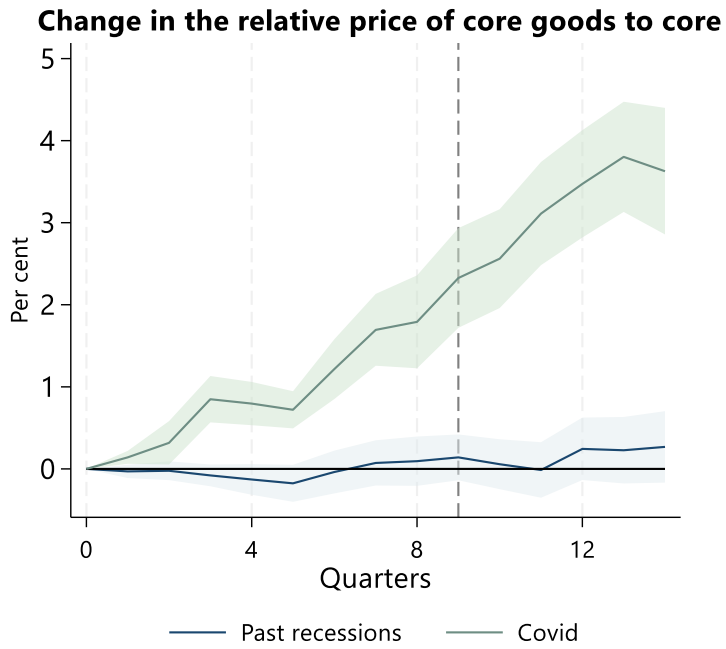
## Large rise in core inflation




## …skewed towards core goods…



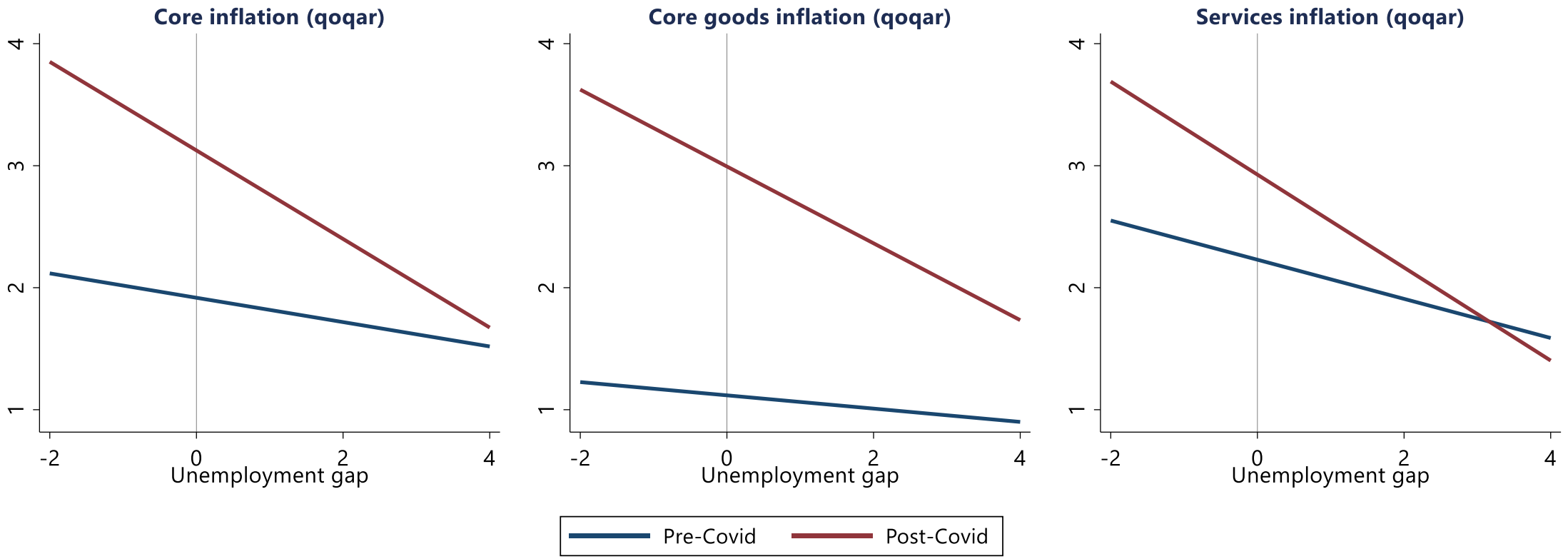

## ….leading to a rise in relative goods prices




Source: Haver, OECD, IMF staff calculations
Note: Sample includes AEs within the OECD from 1990-2023Q1. Shaded areas represent 90% confidence interval.
Vertical line denotes the start of Russia's war in Ukraine

# Steepening and Shifting of Phillips curves

# The Phillips curves steepened and shifted up (at least temporarily)




Note: Phillips curves evaluated at series average values of inflation expectations and lagged inflation

- $\pi_{i,t} = \alpha_i + \beta gap_{i,t} + \gamma Covid_t * gap_{i,t} + \delta Covid_t + \gamma_1 \pi_{i,t-1} + \gamma_1 \pi_{i,t-2} + \gamma_3 \pi^e_{i,t} + \sum_{j=0}^{q} \zeta_{t-j} X_{i,t-j} + \epsilon_{i,t}$
- Same sample of 25 AEs, estimated from 2000 to 2023Q1
- Shift up and steeping robust to (i) non-linearities; (ii) alternative measures of slack (e.g. v/u ratio); (iii) potential endogeneity (e.g. only euro economies and time dummies to control for endogenous monetary policy and instrumenting expectations and slack with lags).

# Insights from a simple model: the shape of the Phillips curve depends on type of recovery

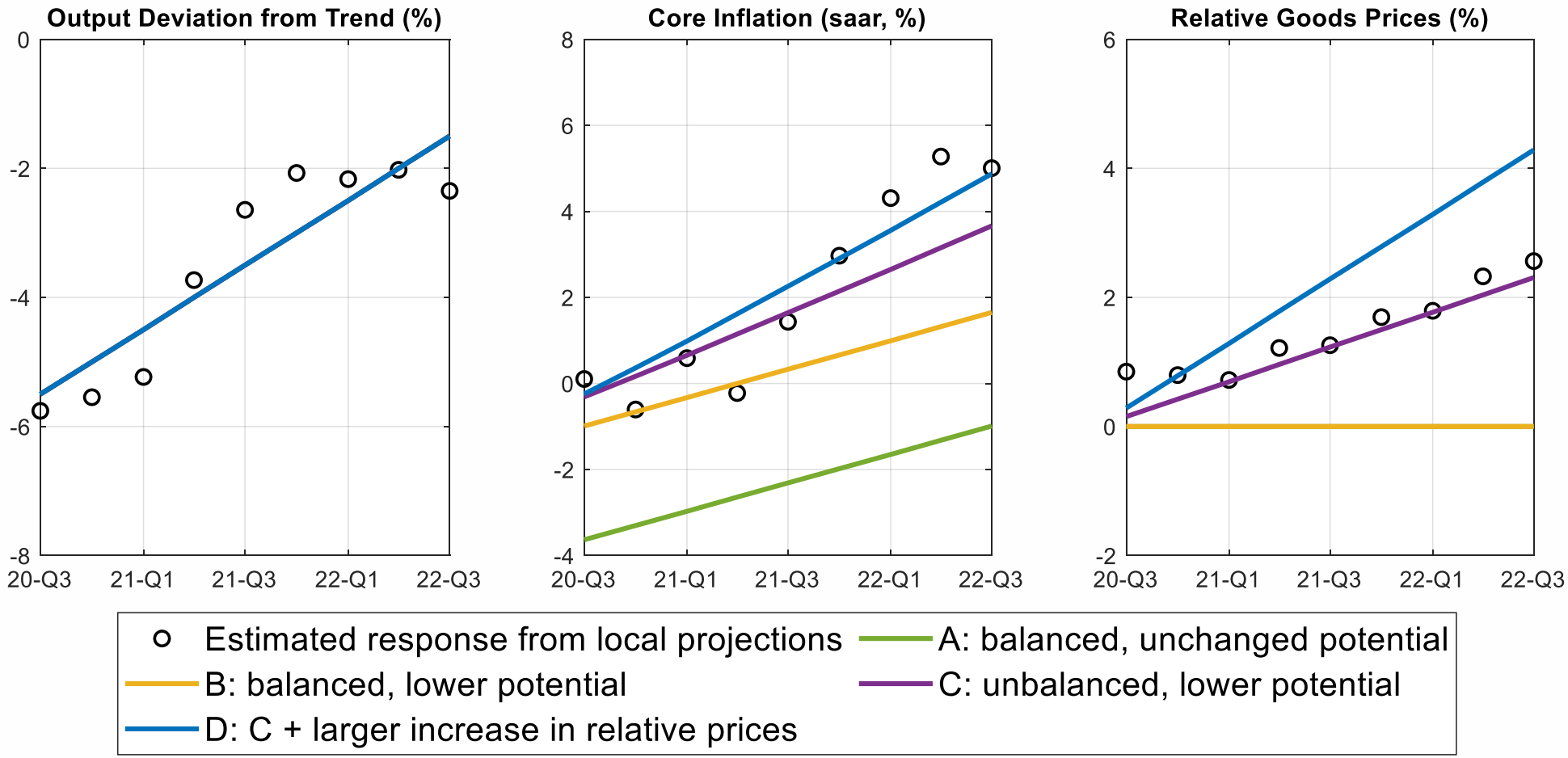
**Balanced and unconstrained recovery (blue):**

- Generates a standard aggregate Phillips curve in which the relative price of goods does not vary much

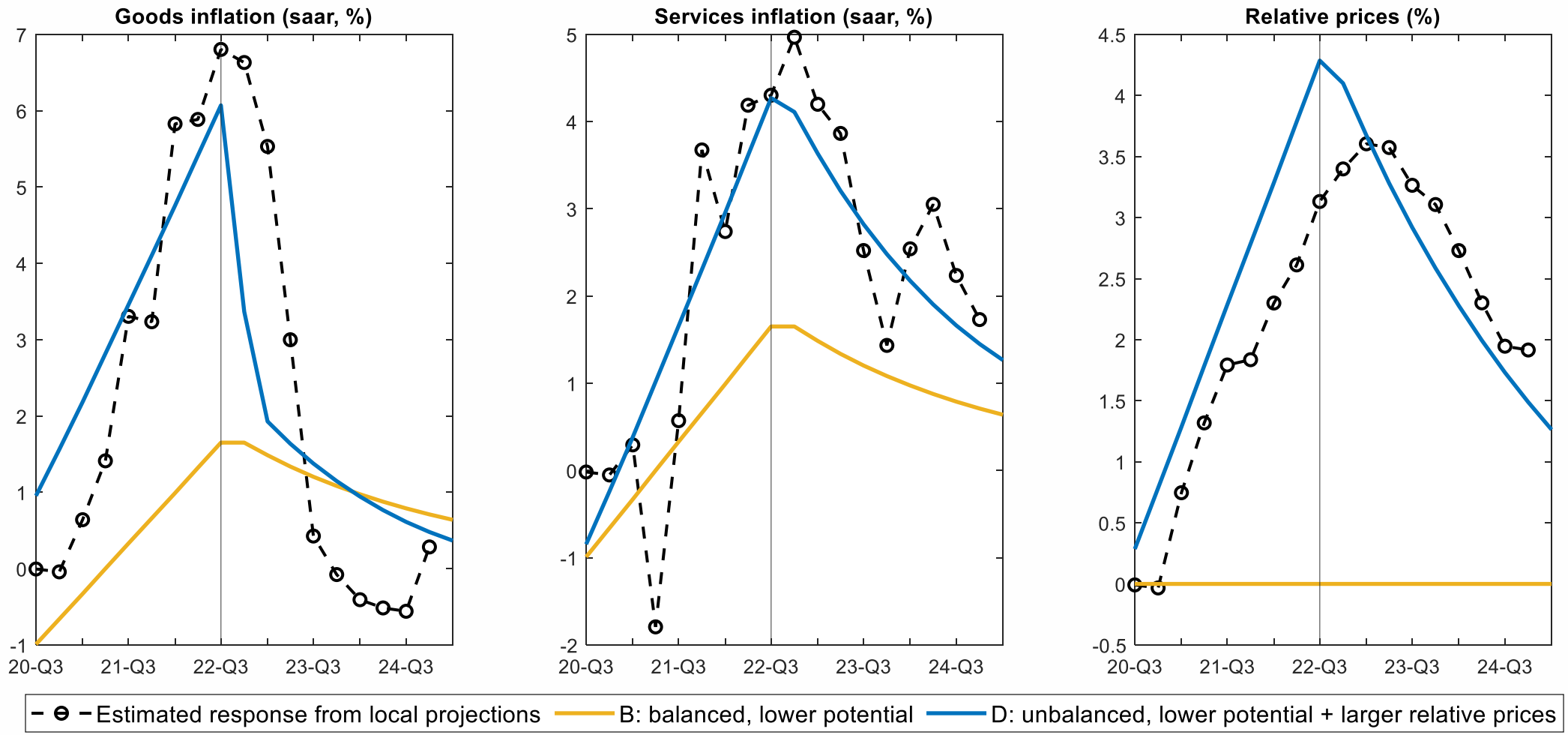
**Unbalanced and constrained recovery (red):**

- Demand runs against supply constraint in goods sector, pushing firms off their Phillips curve
- A binding constraint makes relative goods prices ***procyclical***, i.e., increasing with recovery
- Production costs increase in rest of economy → steeper services Phillips curve
- A new Phillips curve emerges in goods sector: as steep as services Phillips curve and shifted up to accommodate change in relative goods prices

# Simple model replicates inflation dynamics: it requires that potential output is lower and constraints become increasingly binding



# As supply constraints become less binding, goods inflation falls sharply but services disinflation is more gradual

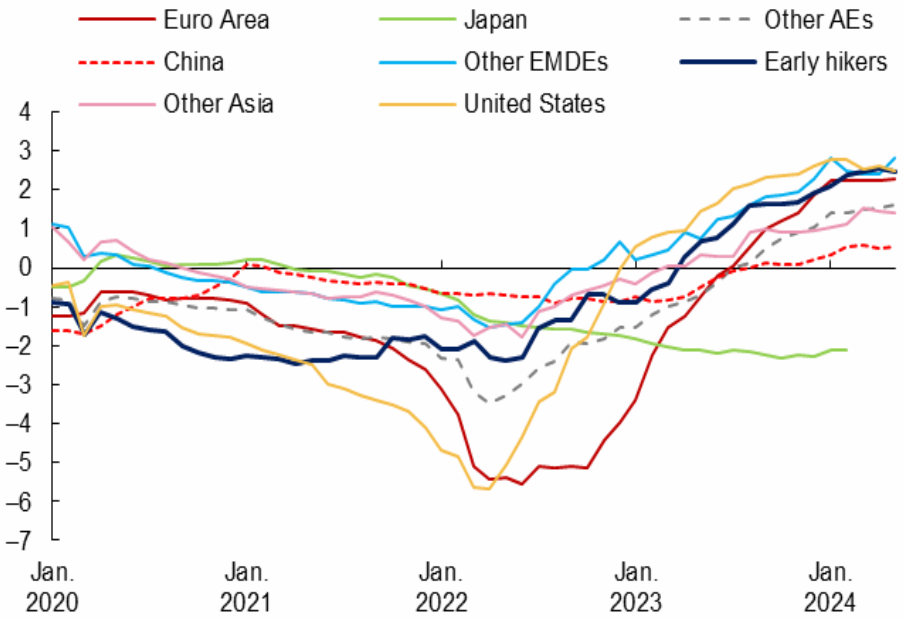


# The Monetary Policy Response

# There was a synchronous monetary policy response, with some EMs hiking earlier

## Monetary Tightening – Real Policy Rate

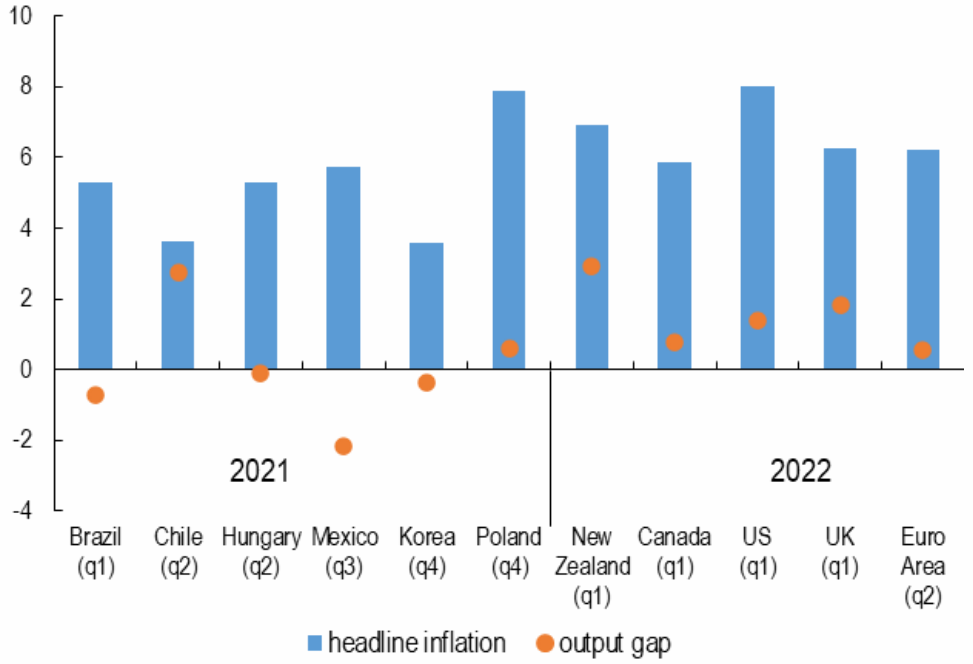
*(Percent, annualized rate)*




Sources: Bank for International Settlements; Consensus Economics; Haver Analytics; and IMF staff calculations.
Note: Real policy rates are computed as nominal policy rates minus 1-year ahead inflation expectations. Sample includes 16 AEs and 65 EMDEs. "Other" aggregates are medians. AEs = advanced economies; EMDEs = emerging market and developing economies. Early hikers=Brazil, Chile, Hungary, New Zealand, Norway, Peru, Poland and South Korea.

## Economic Conditions at lift-off

*(Percent)*

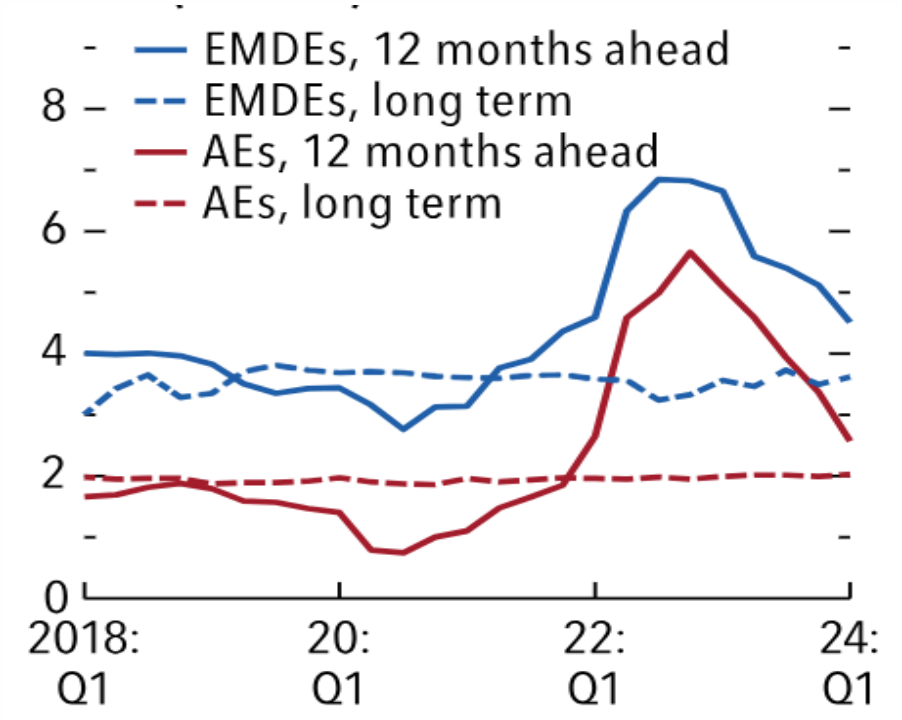



Sources: Bank for International Settlements; Haver Analytics; and IMF staff calculations.
Note: Figure reports economic conditions at first interest rate hike during current tightening cycle for early hikers (Brazil, Chile, Hungary, New Zealand, Norway, Poland and South Korea), Canada, Euro Area, UK, and US. Countries are sorted by the timing of their first interest rate hike. Headline inflation, output gap, and change in nominal effective exchange rate are all reported in percent.

# Muted long-term inflation expectations and real wage movements

## Stable Long-Term Inflation Expectations

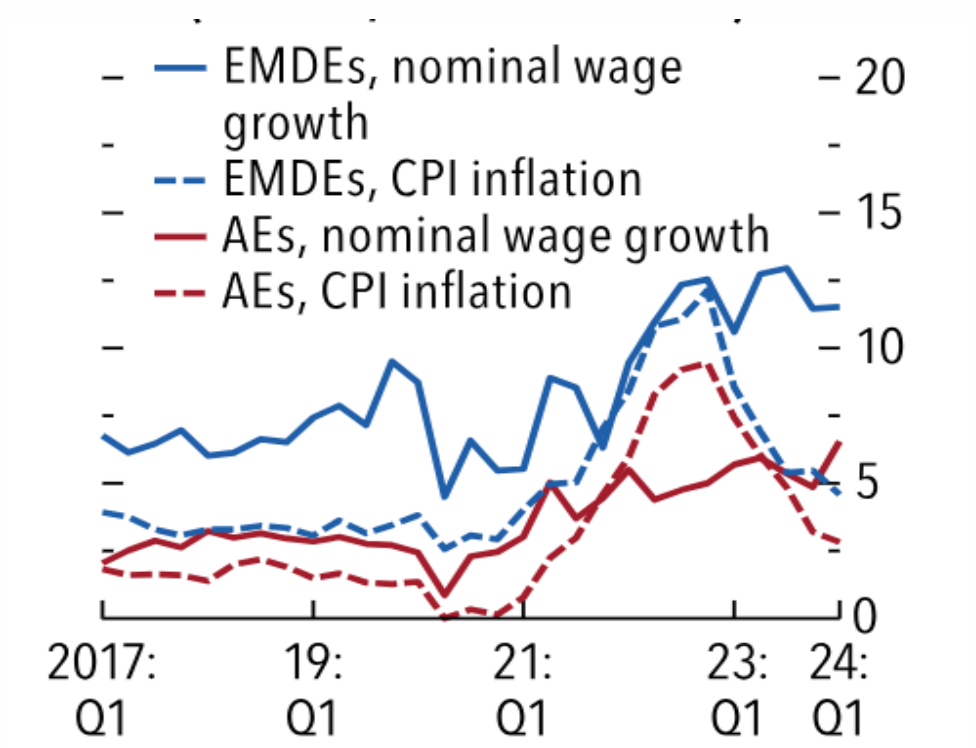
*(Percent)*




Sources: Consensus Economics; and IMF staff calculations.
Note: Figure reports 12-month ahead (solid lines) and long-term 10-year ahead (dashed lines) inflation expectations across advanced economies and emerging markets and developing economies. Each line represents in-group median. AE = advanced economies; EMDE = emerging market and developing economies.

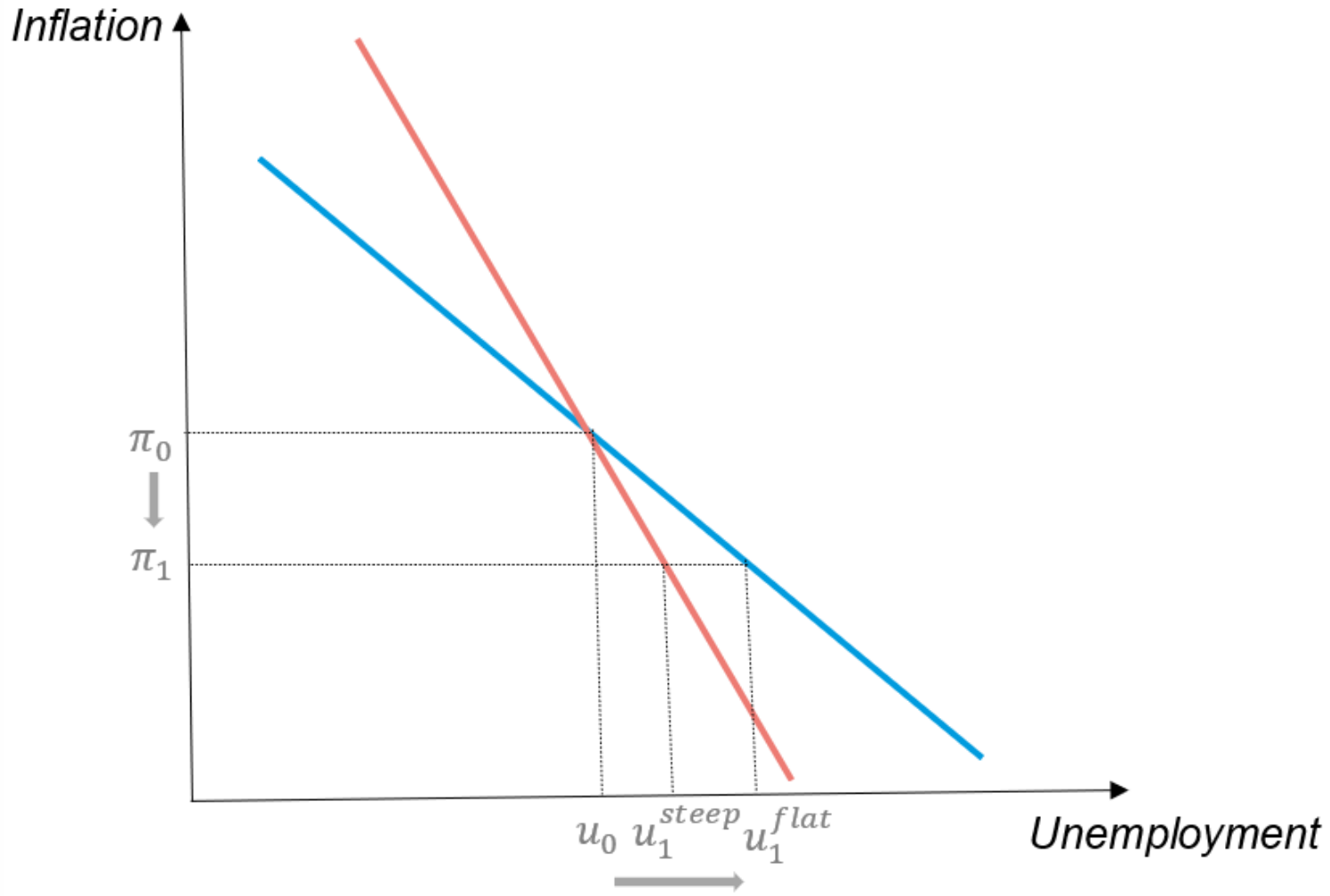
## Moderate Real Wage Growth

*(Percent, annualized rate)*



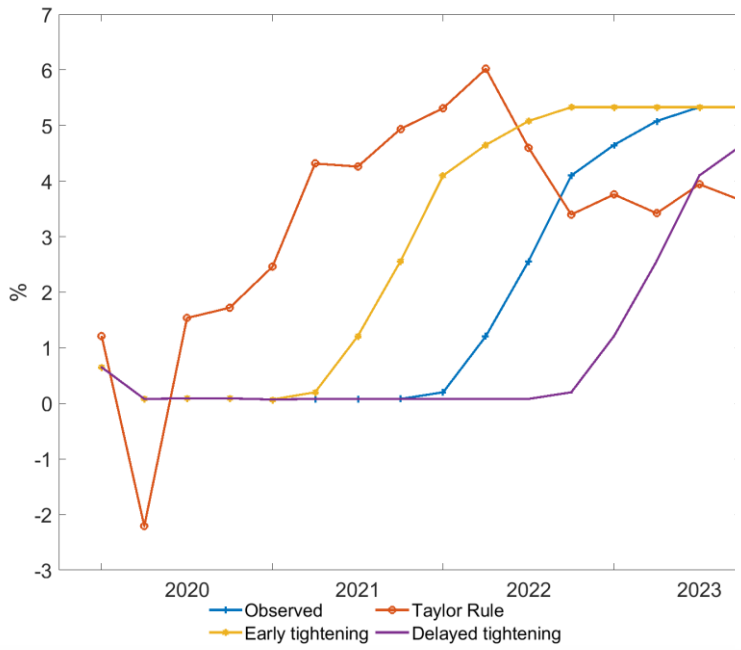

Sources: ILO; OECD; and IMF staff calculations.
Note: Figure reports real wages computed as nominal wages (defined on a per-worker basis) divided by the CPI and then indexed to 100 in each country in 2017Q1. Each line reports group median. AE = advanced economies; EMDE = emerging market and developing economies.

# Disinflation is less costly when Phillips curves are steep

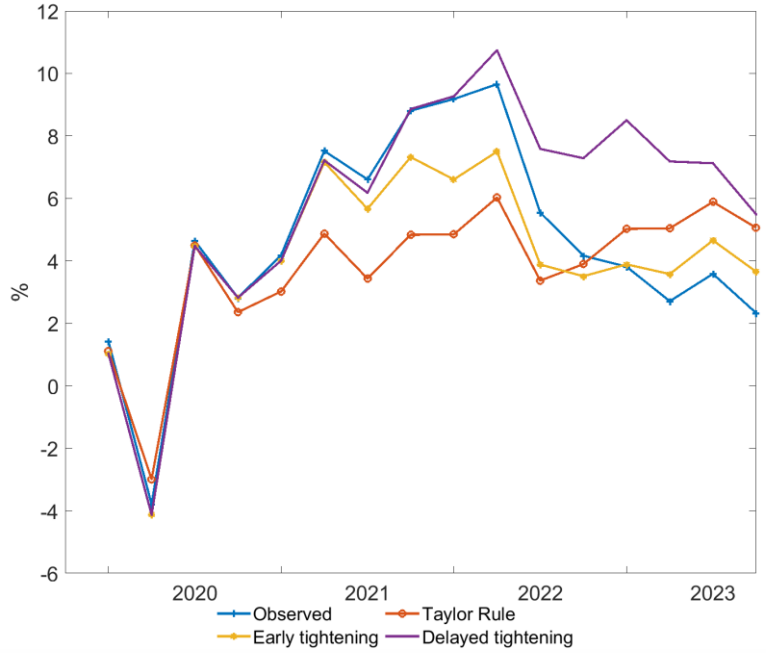


# Simulations in WEO Fall 2024 chapter 2 suggest a moderate output cost of tightening earlier

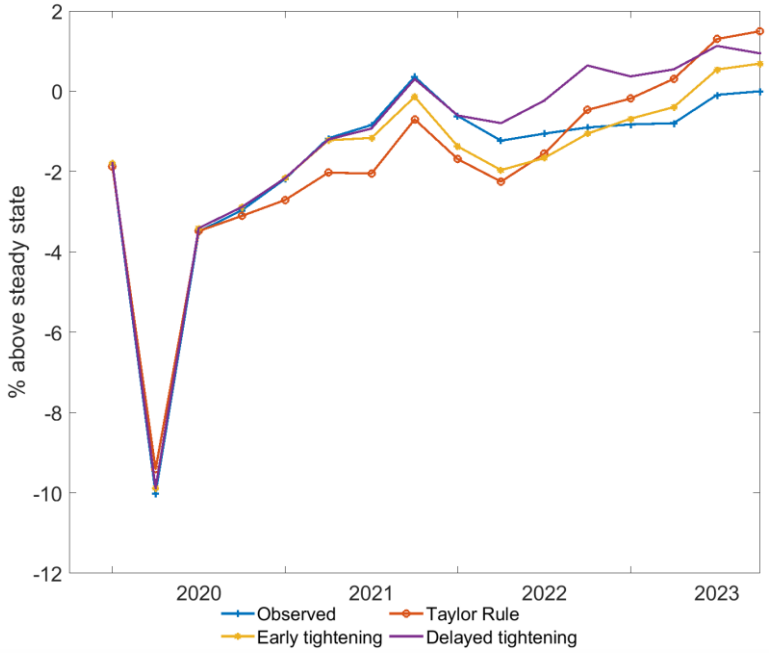
**US interest rates:**
*(Percent)*




**US inflation:**
*(QoQ annualised)*




**US GDP:**
*(Deviation from steady state%)*




Sources: IMF staff calculations
Note: Earlier hiking scenarios assume rates follow Taylor rules assumed in in model. Later hiking is based on arbitrary 3 Qtr delay with same path imposed as shocks.
Monetary policy counterfactuals adjust the wedge between sectoral MPL and wages to ensure that labor constraints bind at levels identified in the baseline

# Conclusion

- Pandemic Recovery was different in important ways: rapid, unbalanced, constrained, and with limited signs of slack.

- These features help explain the surge in inflation, and why the relation between inflation and activity changed.
  - Sectoral inflation dynamics were central to inflation outlook.

- Monetary policy was accommodative initially, but subsequent response stabilized inflation and kept inflation expectations anchored.

- Changes to Phillips curve reduce the costs of disinflation and amplify benefits of monetary policy tightening.

# Inflation and Monetary Policy During the Pandemic Recovery

THANK YOU

# References

Gudmundsson, Tryggvi, Chris Jackson, and Rafael Portillo. 2024. “The Shifting and Steepening of Phillips Curves during the Pandemic Recovery: International Evidence and Some Theory.” IMF Working Paper 24/007, International Monetary Fund, Washington, DC.

IMF, 2024 “The Great Tightening: Insights From The Recent Inflation Episode”. Fall 2024 World Economic Outlook, chapter 2. International Monetary Fund, Washington, DC.