Assessing Maximum Employment
A Flow-Based Approach

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BoG

What is Maximum Employment?

> *The maximum level of employment is a broad-based and inclusive goal that is not directly measurable and changes over time owing largely to nonmonetary factors that affect the structure and dynamics of the labor market. Consequently, it would not be appropriate to specify a fixed goal for employment; rather, the Committee's policy decisions must be informed by assessments of the shortfalls of employment from its maximum level, recognizing that such assessments are necessarily uncertain and subject to revision. The Committee considers a wide range of indicators in making these assessments.*

Statement on Longer-Run Goals and Monetary Policy Strategy

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Statement on Longer-Run Goals and Monetary Policy Strategy

A Flow Approach

Flow approach provides a more accurate picture of the labor market and the additional richness it delivers captures important implications of labor market mechanisms for macroeconomics.

Blanchard & Diamond (1990)

- Provides a unified framework to link **a wide range of indicators**.
- Connects **directly** to the underlying labor market dynamics.
- Helps identify **nonmonetary factors**.
- Distinguishes mechanisms that support a **broad-based and inclusive** goal.

Maximum employment is shaped by both unemployment and participation rates:

$$\Delta EPOP_t = \underbrace{-\overline{LFPR}_t \Delta u_t}_{\textit{unemployment term}} + \underbrace{(1 - \overline{u}_t)\, \Delta LFPR_t}_{\textit{participation term}}$$

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Changes in the LFPR have ≈ 1.6 times larger effect than changes in the unemployment.

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When $\Delta LFPR_t \approx 0$, unemployment fluctuations drive movements in employment.

$\overline{u}_t$: Full-employment unemployment rate

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Trends in participation make it harder to evaluate cyclical progress in EPOP.

Recoveries following the Great recession and the pandemic

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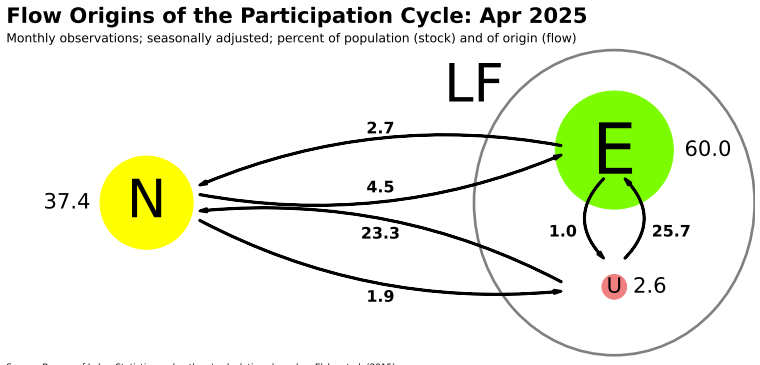
Prevailing narrative: Participation is mildly procylical driven by discouraged workers leaving the labor force during recessions and re-entering as the labor market recovers.

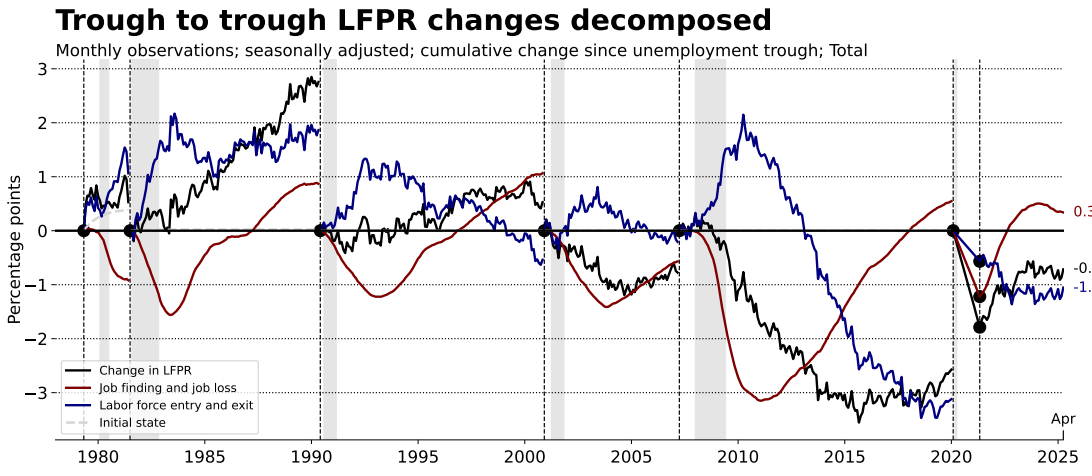
Perry (1971) and Okun (1973)

Unemployment and Participation driven by the same flows



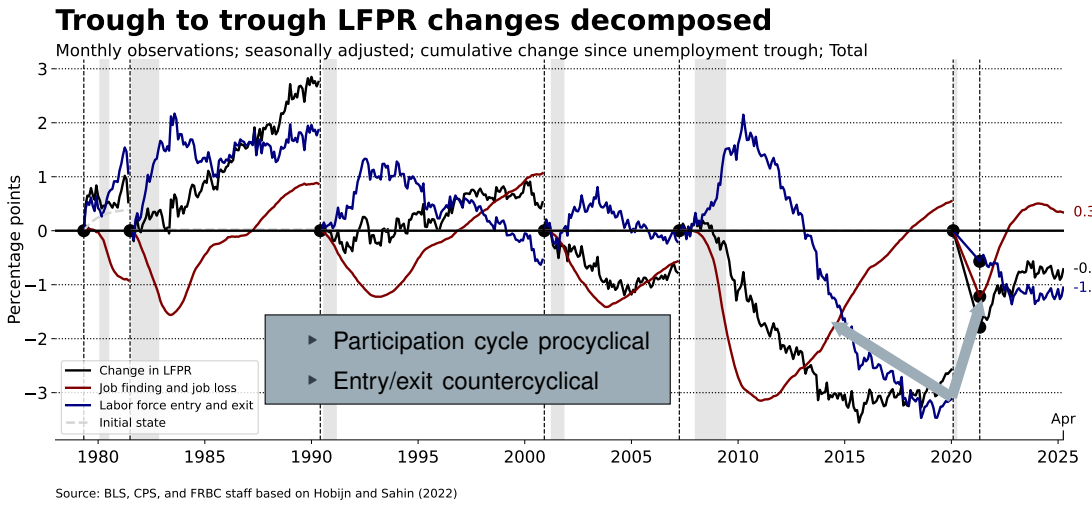
- Flows >> Net changes in stocks
  - Large flows in and out of labor force
- Unemployed are less attached than the employed
  - *Attachment wedge:* 2.8% vs. 25%

Key Intuition: When someone moves from U to E, they are more likely to remain in the labor force going forward. This simple mechanism (*the participation cycle*) is the sources of procyclicality of participation, *not* labor force entry and exit.



Source: BLS, CPS, and FRBC staff based on Hobijn and Sahin (2022)

Note: Seasonally adjusted monthly data. Cumulative effect on LFPR from every trough in the unemployment rate. Entry is contribution from $P_{N,U}$ and $P_{N,E}$, exit is contribution from $P_{U,N}$ and $P_{E,N}$, and cycle from flows between U and E, i.e. $P_{E,U}$ and $P_{U,E}$.



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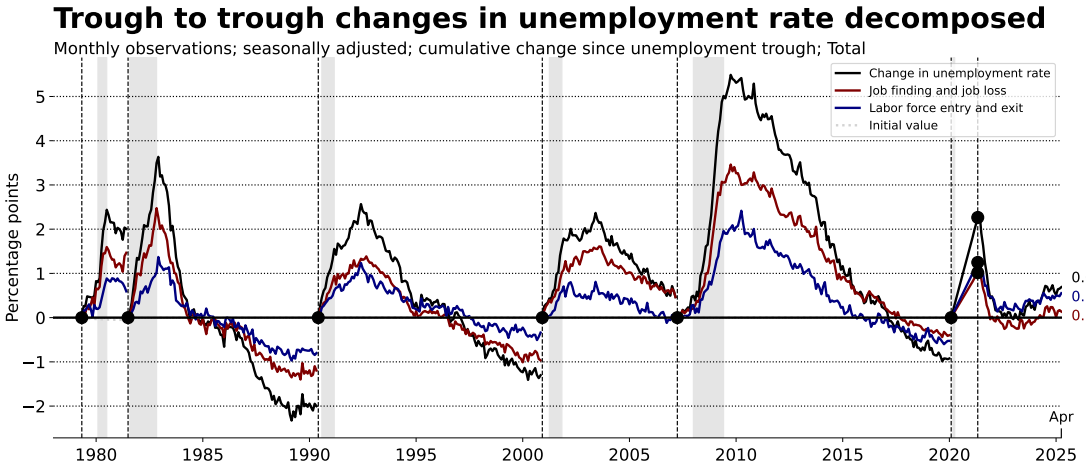

Source: BLS, CPS, and authors' based on Elsby et al. (2019)

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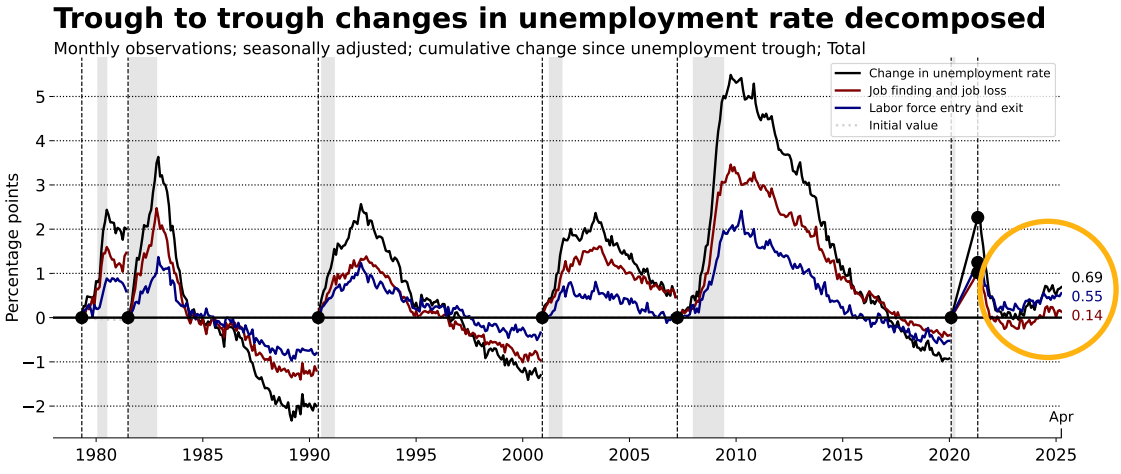

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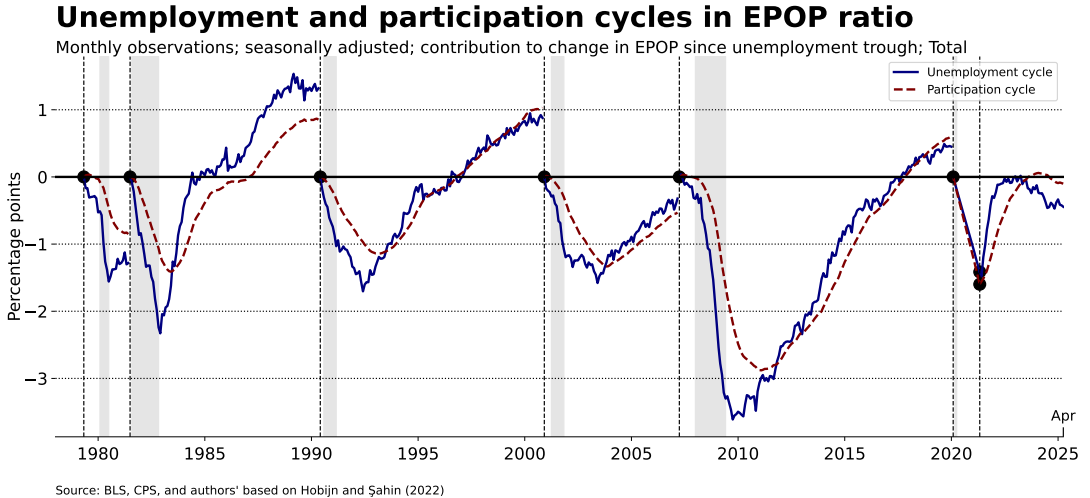
The cyclical change in the employment-to-population ratio is the sum of unemployment and participation cycles:

$$\Delta EPOP_t^c = \underbrace{-\overline{LFPR}_t \Delta u_t}_{\text{unemployment cycle}} + \underbrace{(1-\overline{u}_t)\,\Delta LFPR_t^c}_{\text{participation cycle}}$$

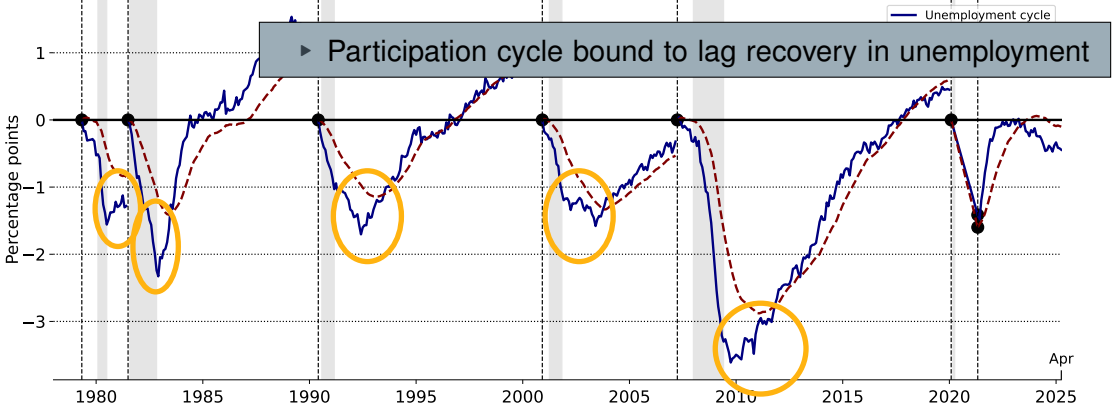


Source: BLS, CPS, and authors' based on Hobijn and Şahin (2022)

Note: Unemployment cycle is cumulative sum of $-\overline{LFPR}_t \Delta u_t$ and LFPR cycle is cumulative sum of $(1 - \bar{u}_t)\, \Delta LFPR_t^c$. Projections

Unemployment and participation cycles in EPOP ratio

Monthly observations; seasonally adjusted; contribution to change in EPOP since unemployment trough; Total



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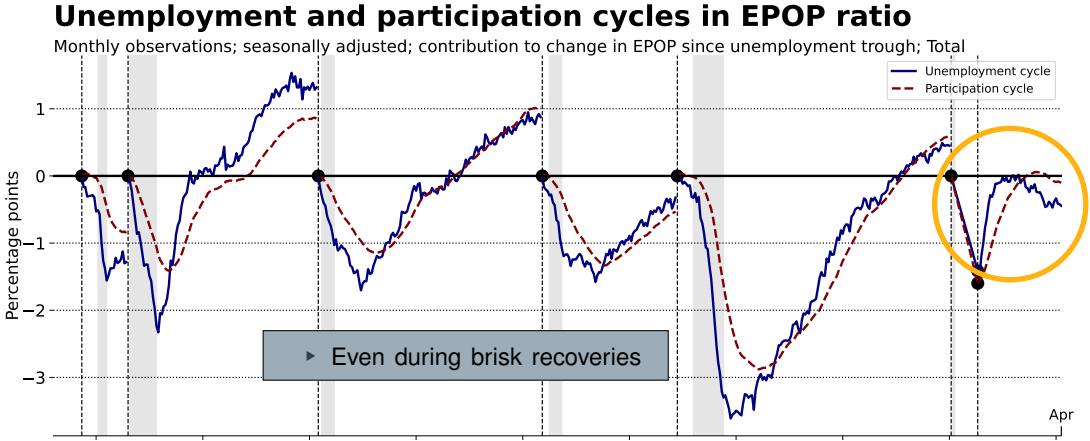

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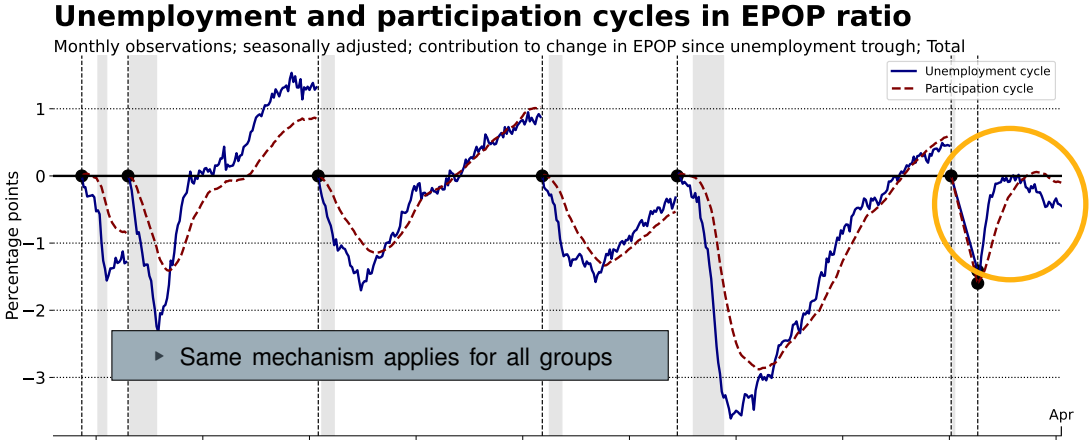
Effect of unemployment and participation cycles on EPOP



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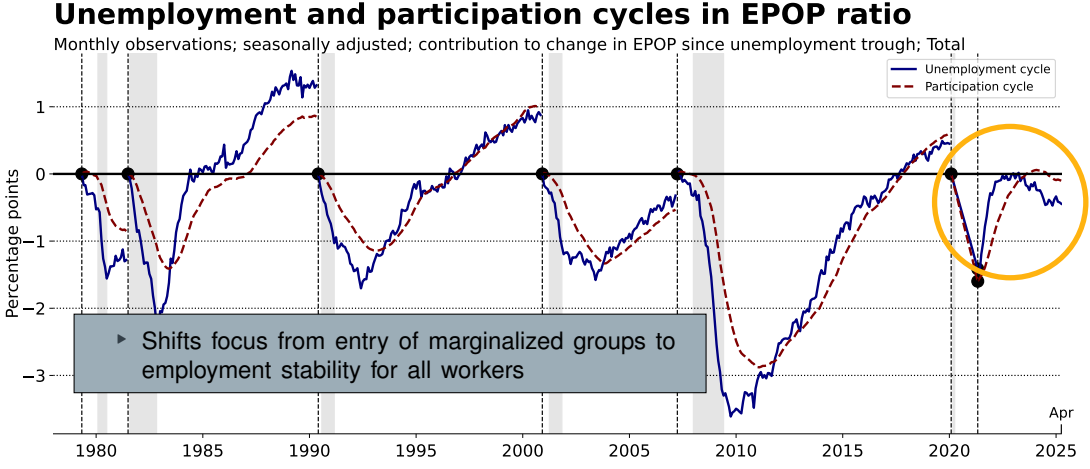

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Statement on Longer-Run Goals and Monetary Policy Strategy

Natural rate of unemployment a là Friedman (1968)

Natural rate of unemployment:

$$u_t^* = \bar{u}_t + \tilde{u}_t$$

- Consistent with stable level of inflation
- Driven by non-monetary factors and time varying

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Natural rate of unemployment:

$$u_t^* = \bar{u}_t + \tilde{u}_t$$

- $\bar{u}_t$: secular trends—such as demographics, female labor force participation
- $\tilde{u}_t$: temporary labor market shifts—such as mismatch, on-the-job search intensity

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Unemployment gap:

$$x_t = u_t - u_t^*$$

- Captures degree of inflationary pressures
- Affected by business cycle conditions and monetary policy

Nominal wages are 'sticky' and inflation reflects current and *future* labor market conditions as measured by the unemployment gap.

Galí (2011)

$$\pi_t = \underbrace{\pi_t^* - \kappa x_t - \kappa\beta\mathbb{E}_t \sum_{T=t}^{\infty} \beta^{T-t} x_{T+1}}_{\text{Underlying inflation}} + \underbrace{\mathbb{E}_t \sum_{s=t}^{\infty} \beta^{s-t} g_{a,t}}_{\text{Temporary 'supply shocks'}}$$

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π_t: inflation

π_t^*: long-run inflation expectations

$g_{a,t}$: productivity and markups

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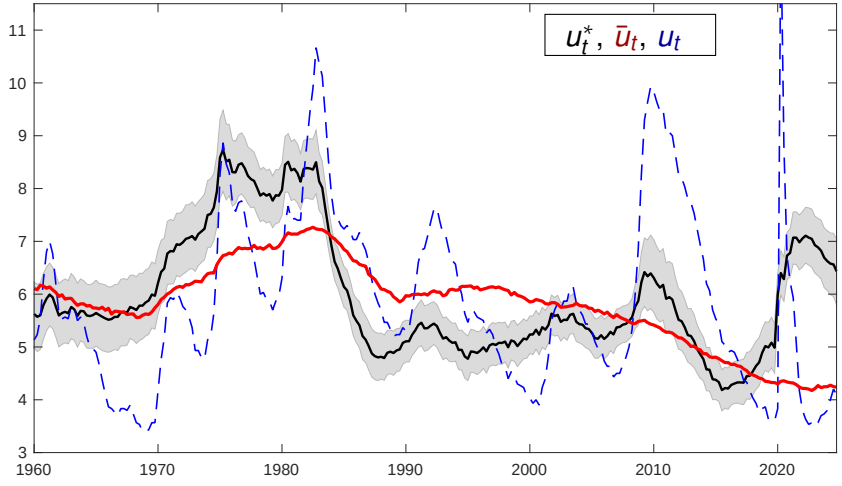
Estimate u_t^*:

1. Unemployment rate u_t and flows to estimate $\bar{u}_t$
3. Federal Reserve Bank of Cleveland's median CPI inflation (π_t)
4. Five measures of labor compensation
5. Inflation expectations: Five-to-ten years ahead (π_t^*) and six-months ahead

Natural rate of unemployment u_t^*



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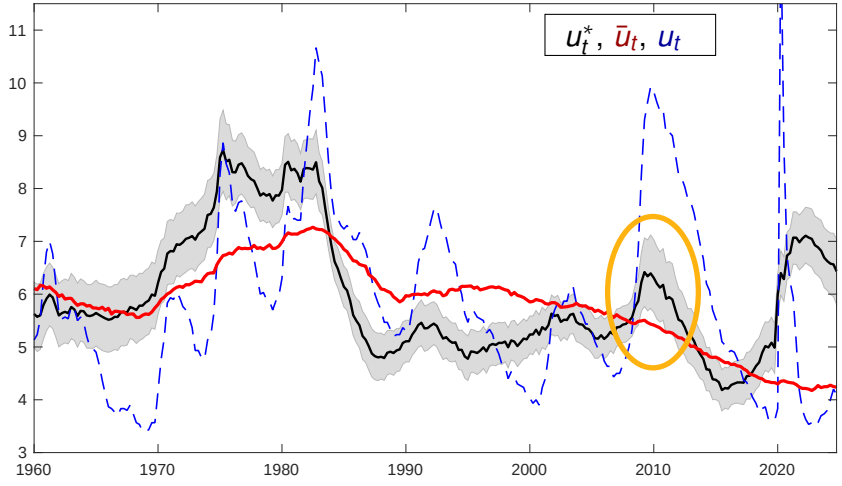

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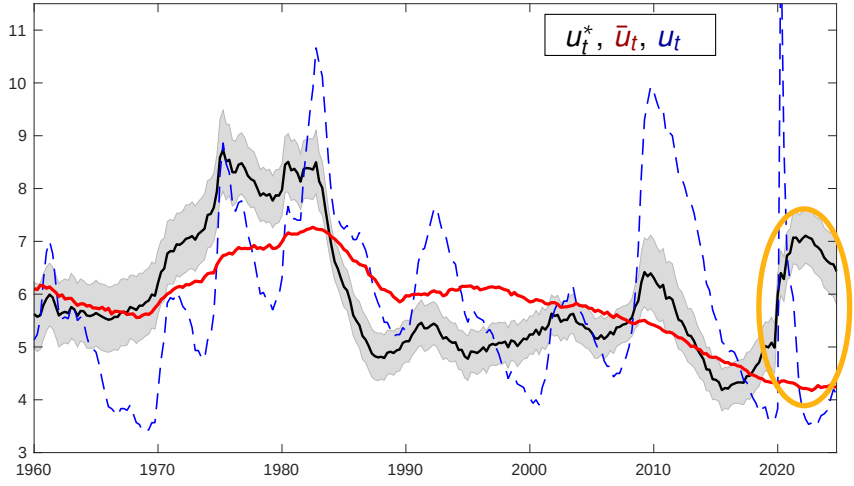
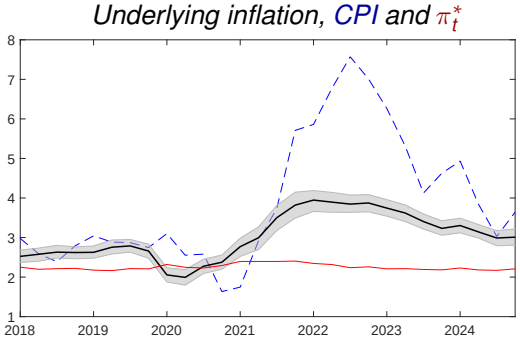
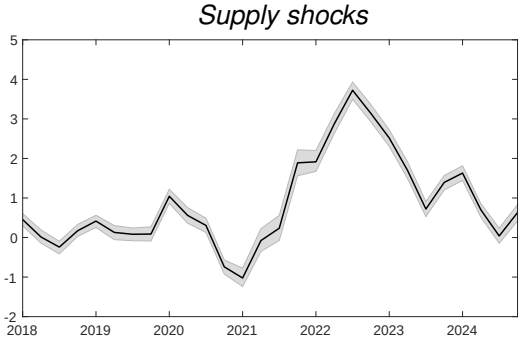


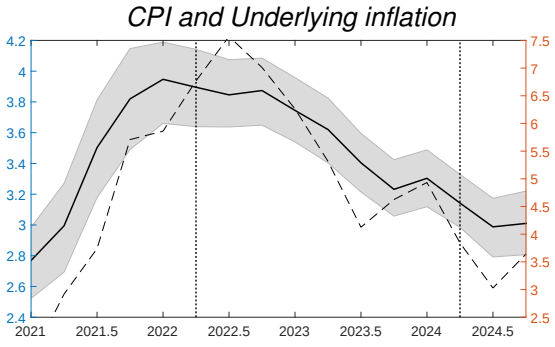
Recent Inflation Surge

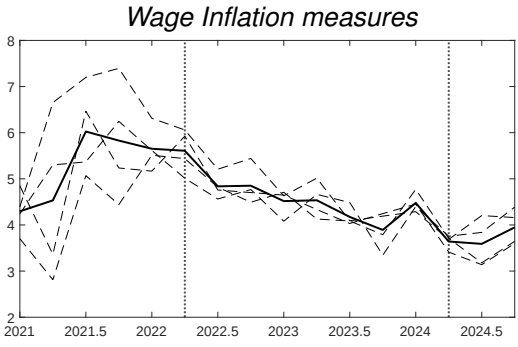




Large and persistent negative unemployment gaps contributed to recent surge in inflation

Soft Landing: Disinflation with little increase in u

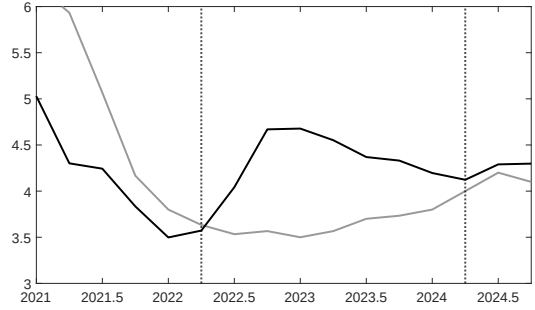




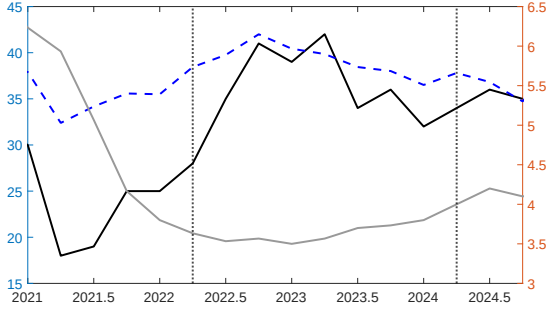
Bulk of the decline in price and wage inflation occurred between 2022Q2 and 2024Q2.

Soft Landing: The role of Expectations

BCEI forecast and unemployment



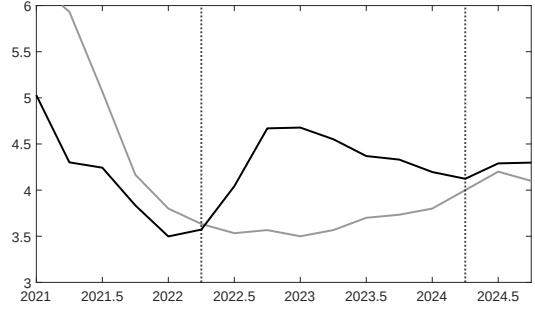
SCE/Michigan forecasts and *unemployment*



- Increase in unemployment expectations of forecasters and households....
- ...while the unemployment rate remained low.

Soft Landing: The role of Expectations

BCEI forecast and unemployment



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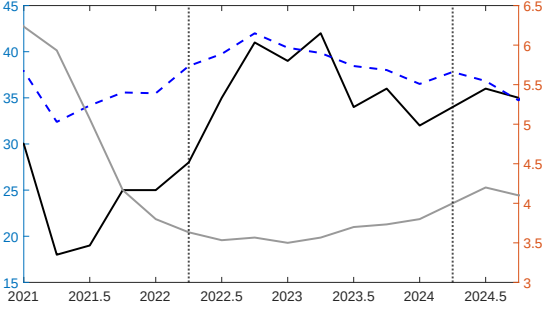


$$\textit{Underlying inflation} = \pi_t^* - \underbrace{\kappa x_t}_{\textit{slack}} - \underbrace{\kappa\beta\mathbb{E}_t \sum_{T=t}^{\infty} \beta^{T-t} x_{T+1}}_{\textit{expected slack}}$$

Employment evolves as workers separate and vacancy positions get filled:

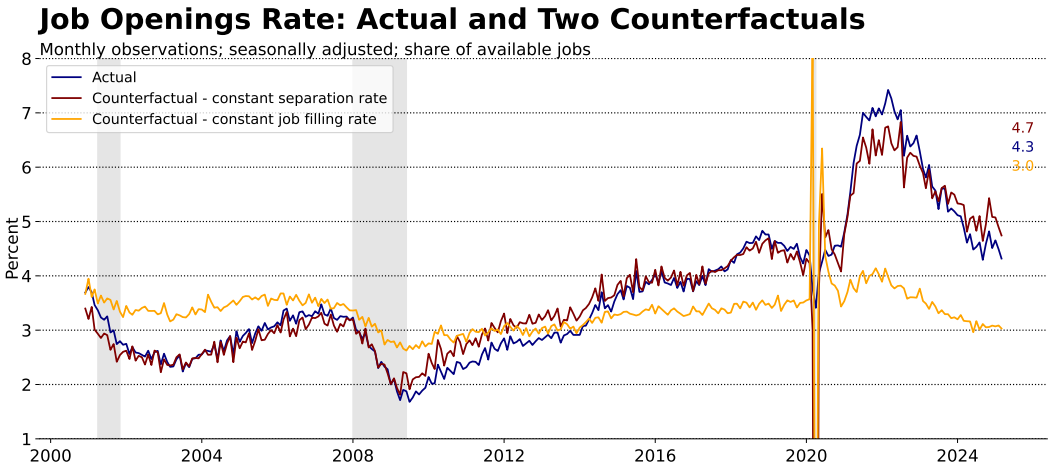
$$E_{t+1} = E_t - \underbrace{s_t E_t}_{\text{separations}} + \underbrace{q_t V_t}_{\text{hires}}$$

Vacancy rate depends on employment growth g_t, separations s_t and the job-filling rate q_t:

$$V_t = \frac{1}{1+\frac{q_t}{g_t+s_t}}$$

With $g_t \approx 0.067\%$ and $s_t \approx 3.6\%$, vacancy rate predominantly determined by how quickly separations are replaced, s_t/q_t.

Vacancies are driven by job filling and separations



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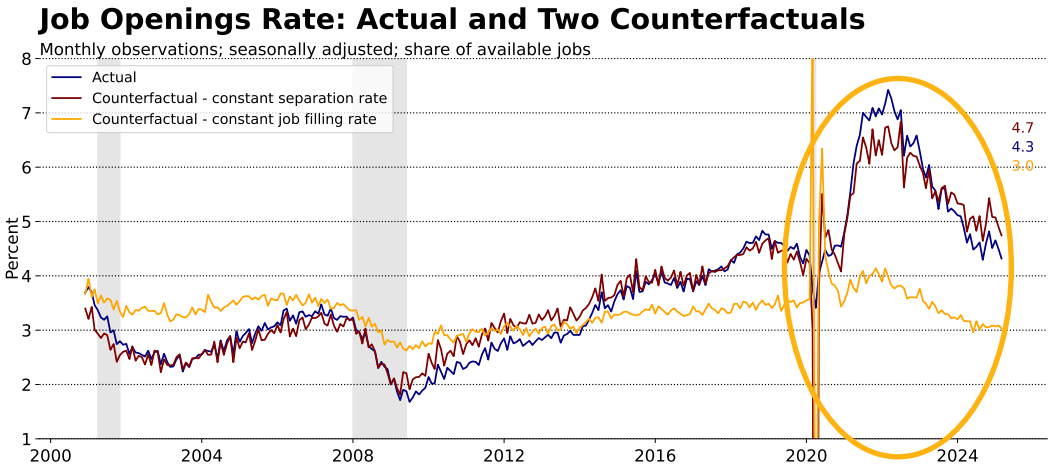

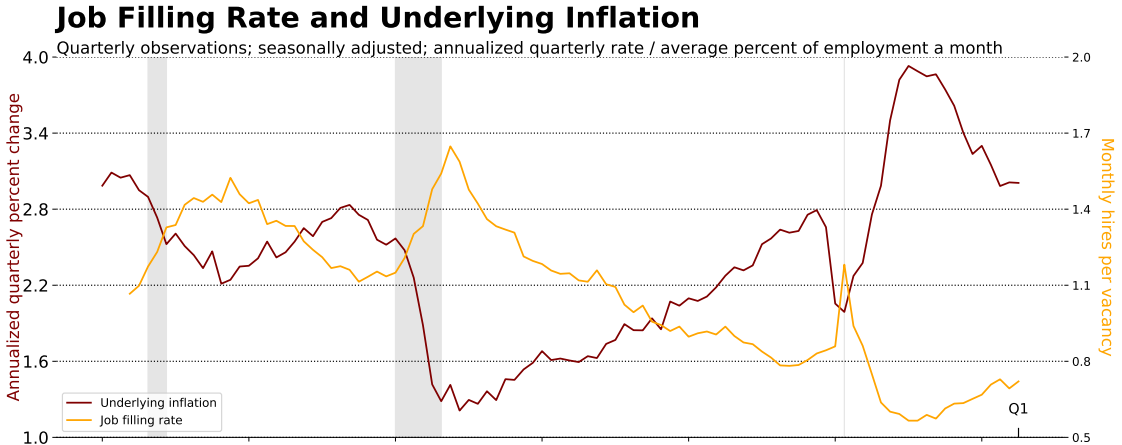
Job Filling Rate and Underlying Inflation
Quarterly observations; seasonally adjusted; annualized quarterly rate / average percent of employment a month
Annualized quarterly percent change
Monthly hires per vacancy
4.0
3.4
2.8
2.2
1.6
1.0
2.0
1.7
1.4
1.1
0.8
0.5
2000
2004
2008
2012
2016
2020
2024
Underlying inflation
Job filling rate
Q1
Source: Bureau of Labor Statistics, BEA, and authors' calculations
Forecast

Key takeaways

The flow approach offers a unified framework for interpreting a wide range of labor market indicators.

- Highlights employment stability across all groups to support the broad-based and inclusive goal.
- Offers two real-time indicators—the unemployment cycle and the participation cycle to assess shortfalls from maximum employment.

The flow approach also creates a bridge to understanding price stability.

- Connects to nonmonetary factors and underlying economic mechanisms.
- Helps identify the natural rate of unemployment.

References

Blanchard, Olivier J., & Diamond, Peter. 1990. The cyclical behavior of the gross flows of U.S. workers. *Brookings papers on economic activity*, **21**(2), 85–155.

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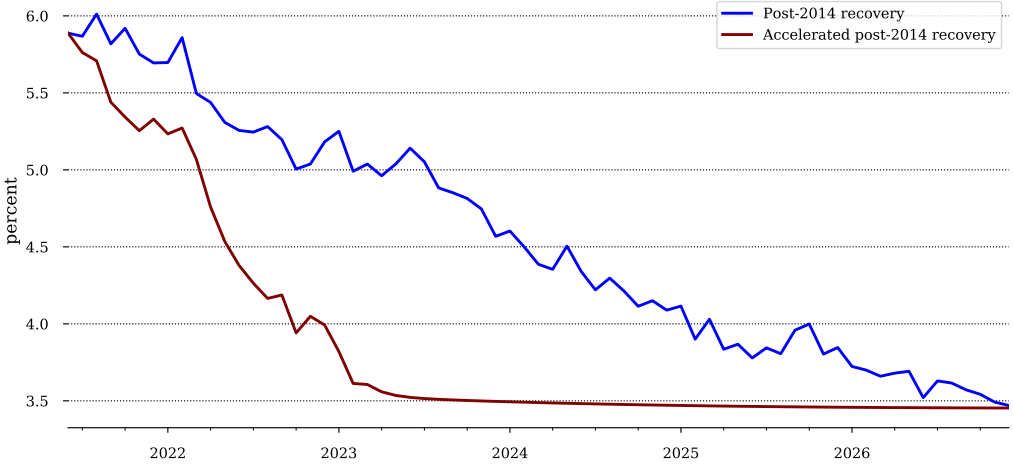
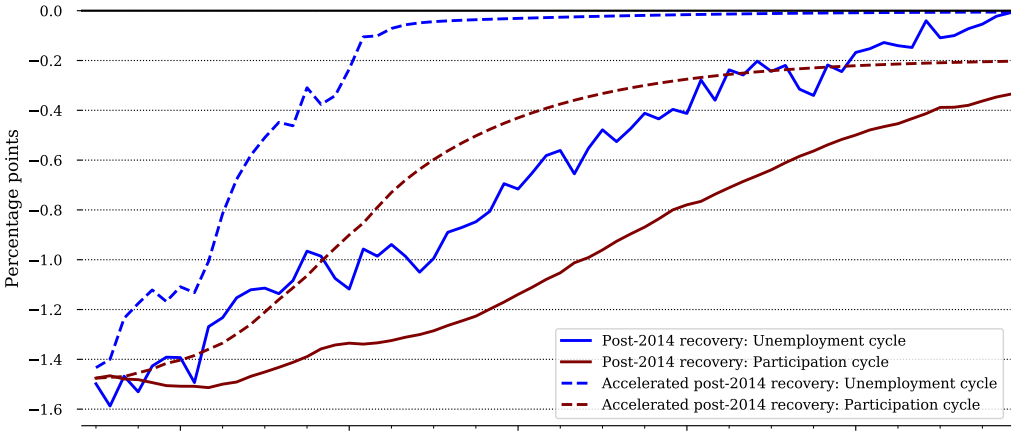
Unemployment projections



UNEMPLOYMENT AND PARTICIPATION CYCLES



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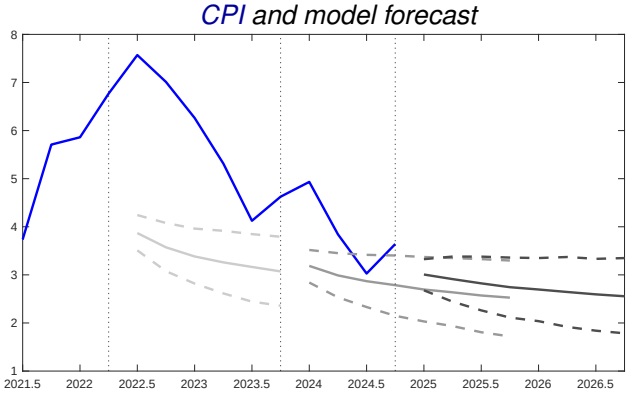
Is the Model Useful? Inflation Forecast Since 2022



- Forecasts taken in 2022Q2, 2023Q3 and 2024Q4 respectively
- Model forecast predicts sluggish inflation adjustment since 2022

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