# $u^* = \sqrt{uv}$

Pascal Michaillat, Emmanuel Saez

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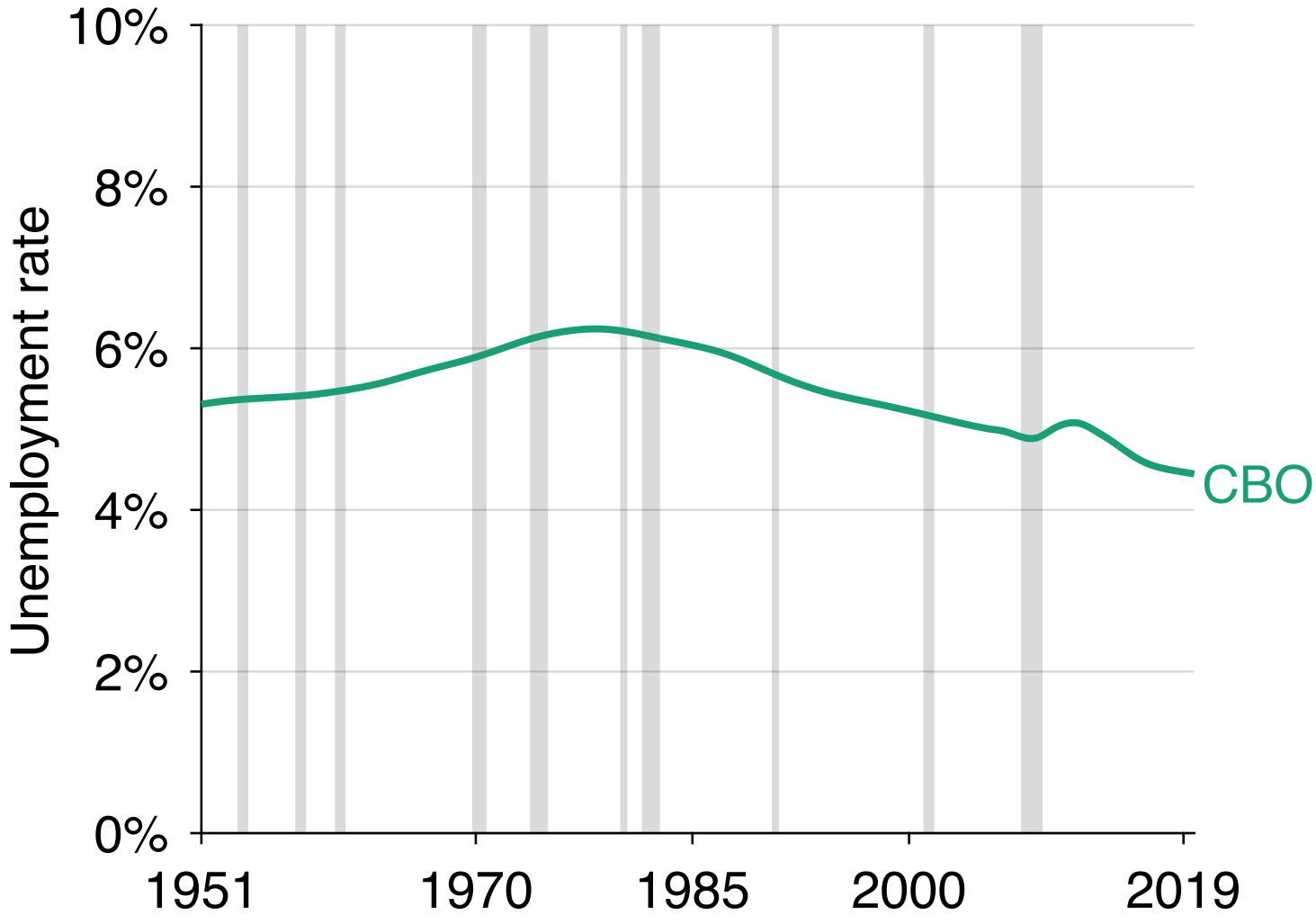
Paper available at https://pascalmichaillat.org/13/

# ROLES OF EFFICIENT UNEMPLOYMENT RATE, $u^*$

1. sufficient statistic for optimal stabilization policies
   - monetary policy (Michaillat, Saez 2022)
   - fiscal policy (Michaillat, Saez 2019)
   - unemployment insurance (Landais, Michaillat, Saez 2018)
2. welfare-based measure of “full employment”
   - Full Employment and Balanced Growth Act of 1978

# EXISTING MEASURES OF "FULL EMPLOYMENT"



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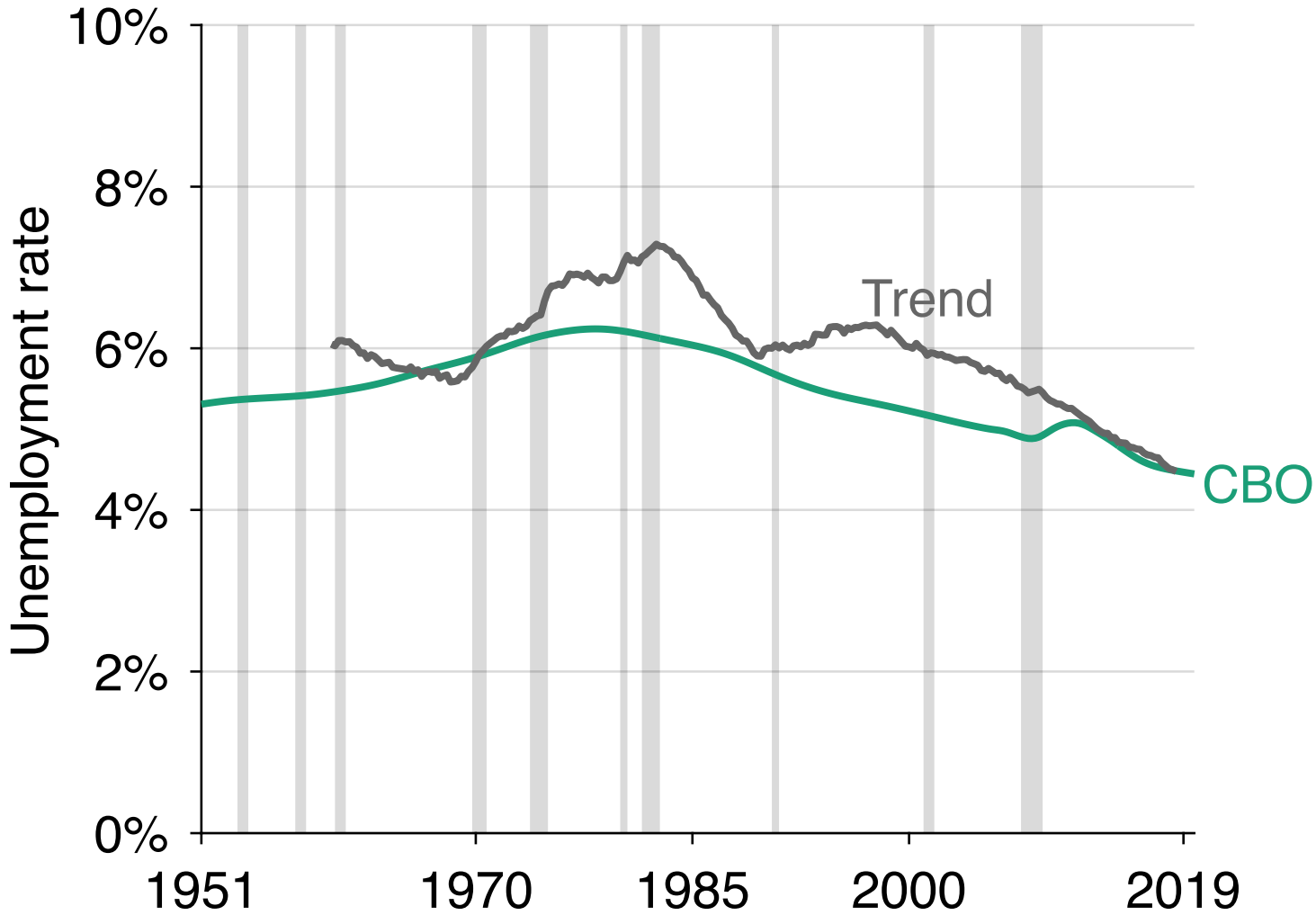

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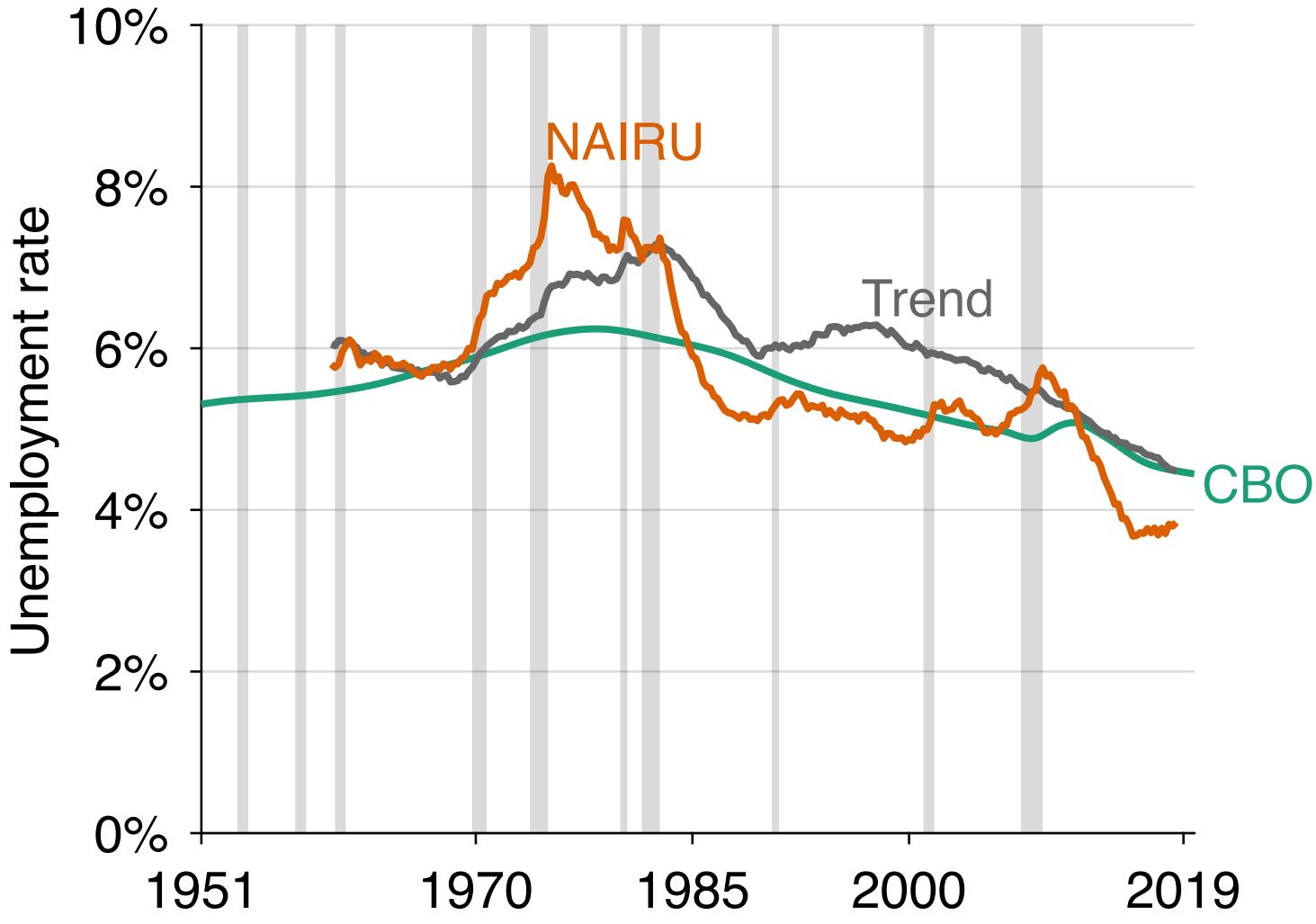
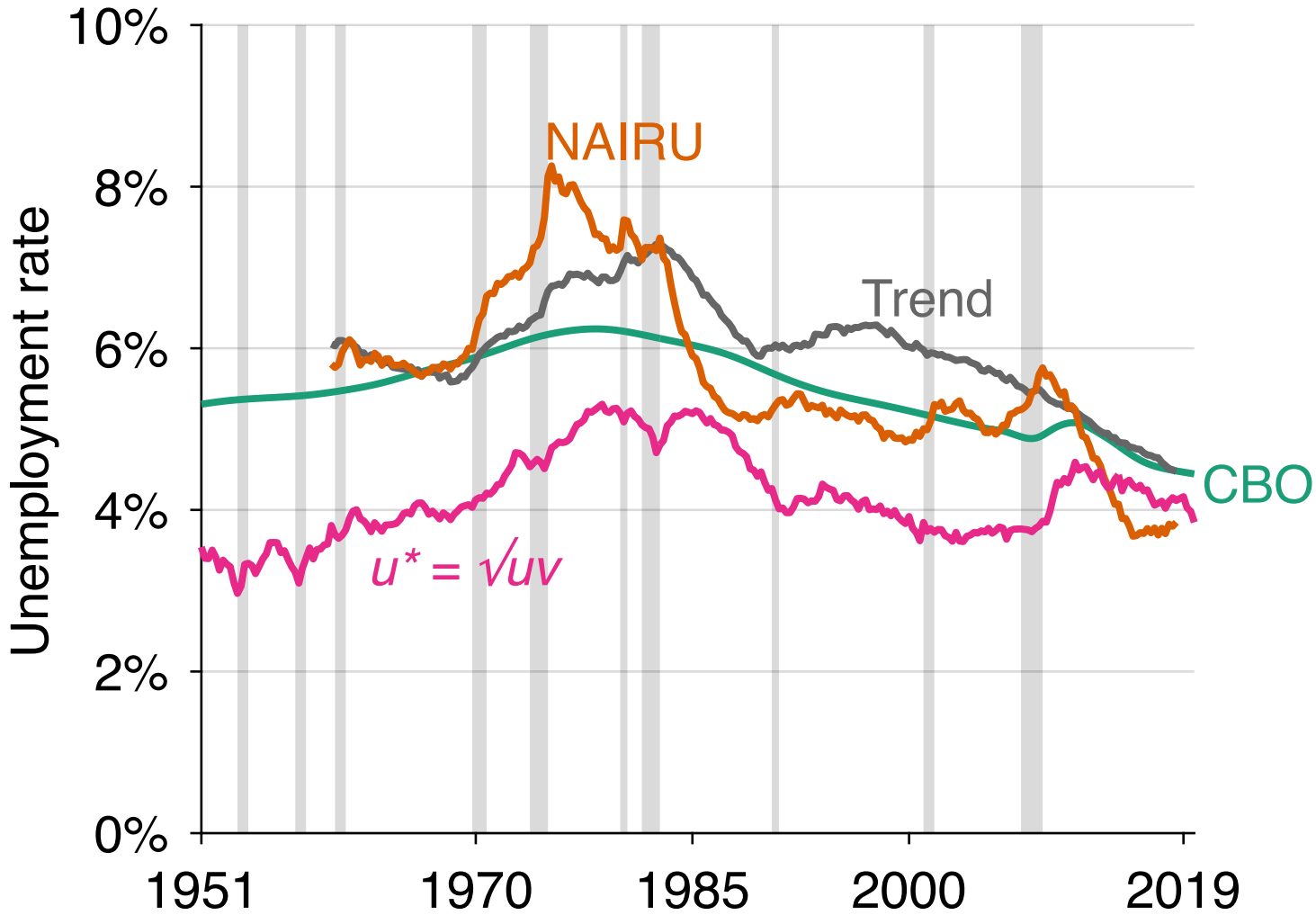


# THIS PAPER: WELFARE-BASED "FULL EMPLOYMENT"

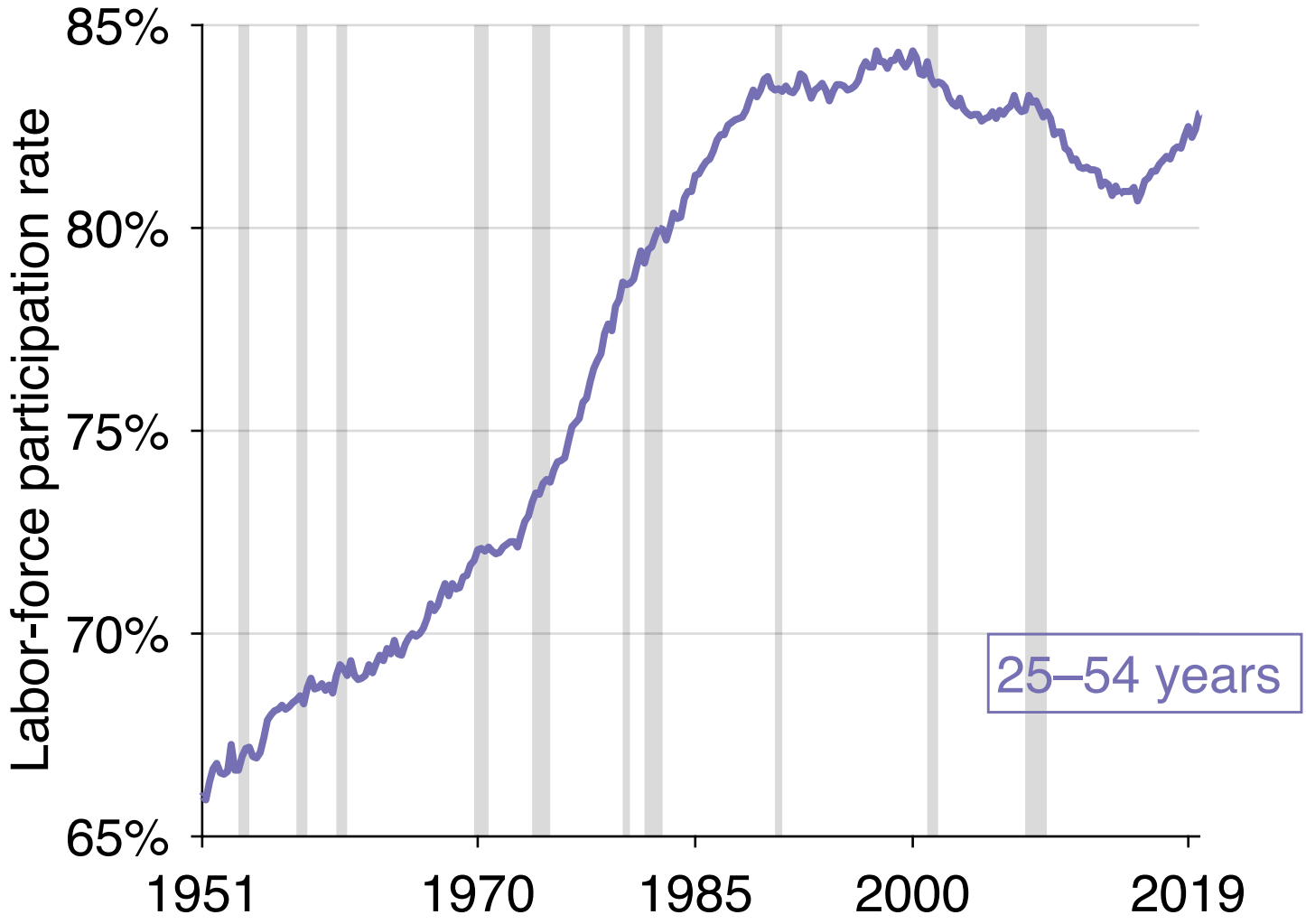


# THEORY

# COMPOSITION OF LABOR FORCE

1. share $u$ of labor force is unemployed
    - no home production (Borgschulte, Martorell 2018)
2. share $v$ of labor force is employed recruiting
    - one worker per vacancy (National Employer Survey 1997)
3. share $1 - (u + v)$ of labor force is employed producing
    - production determines social welfare

# US LABOR-FORCE PARTICIPATION ≈ ACYCLICAL



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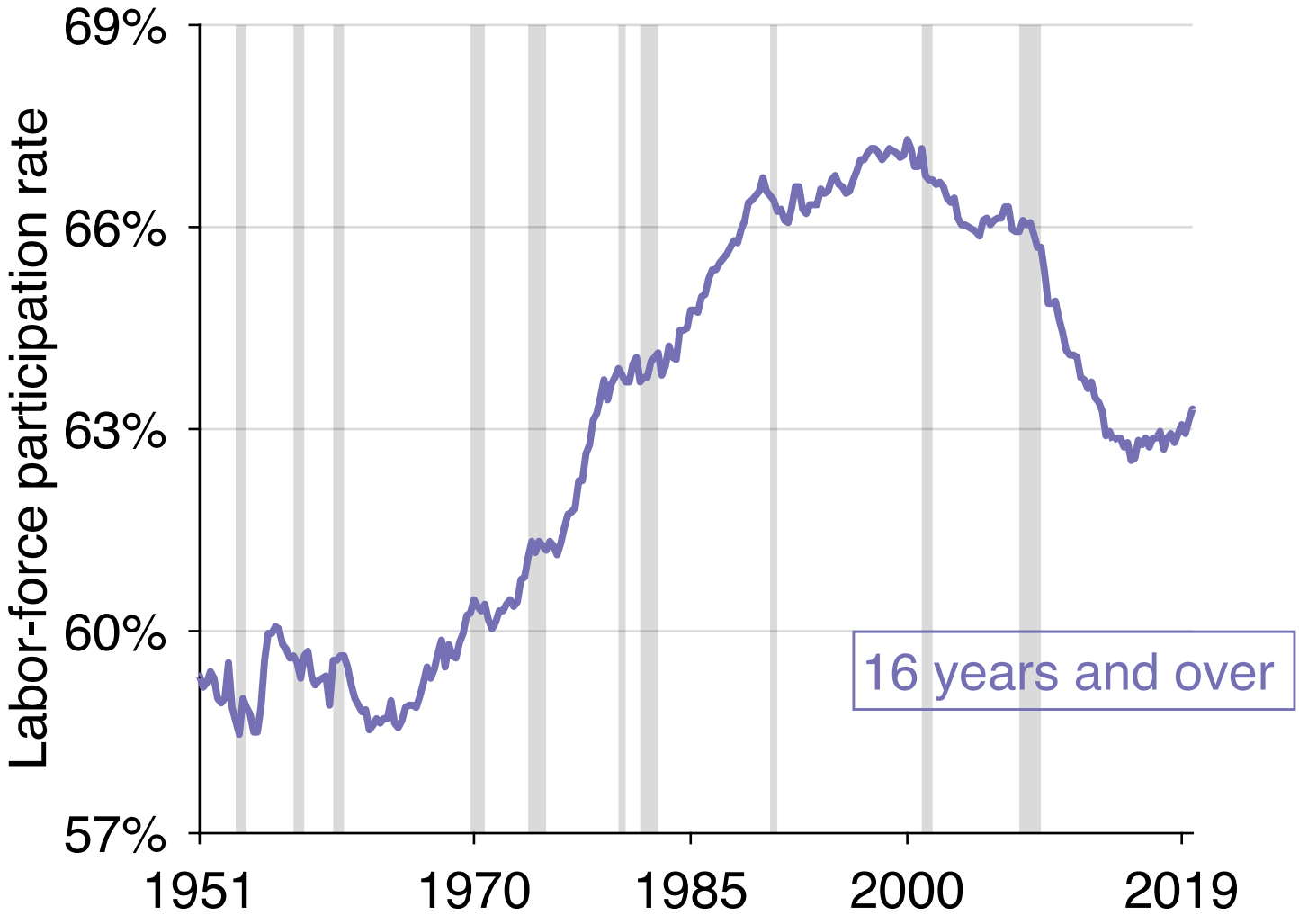
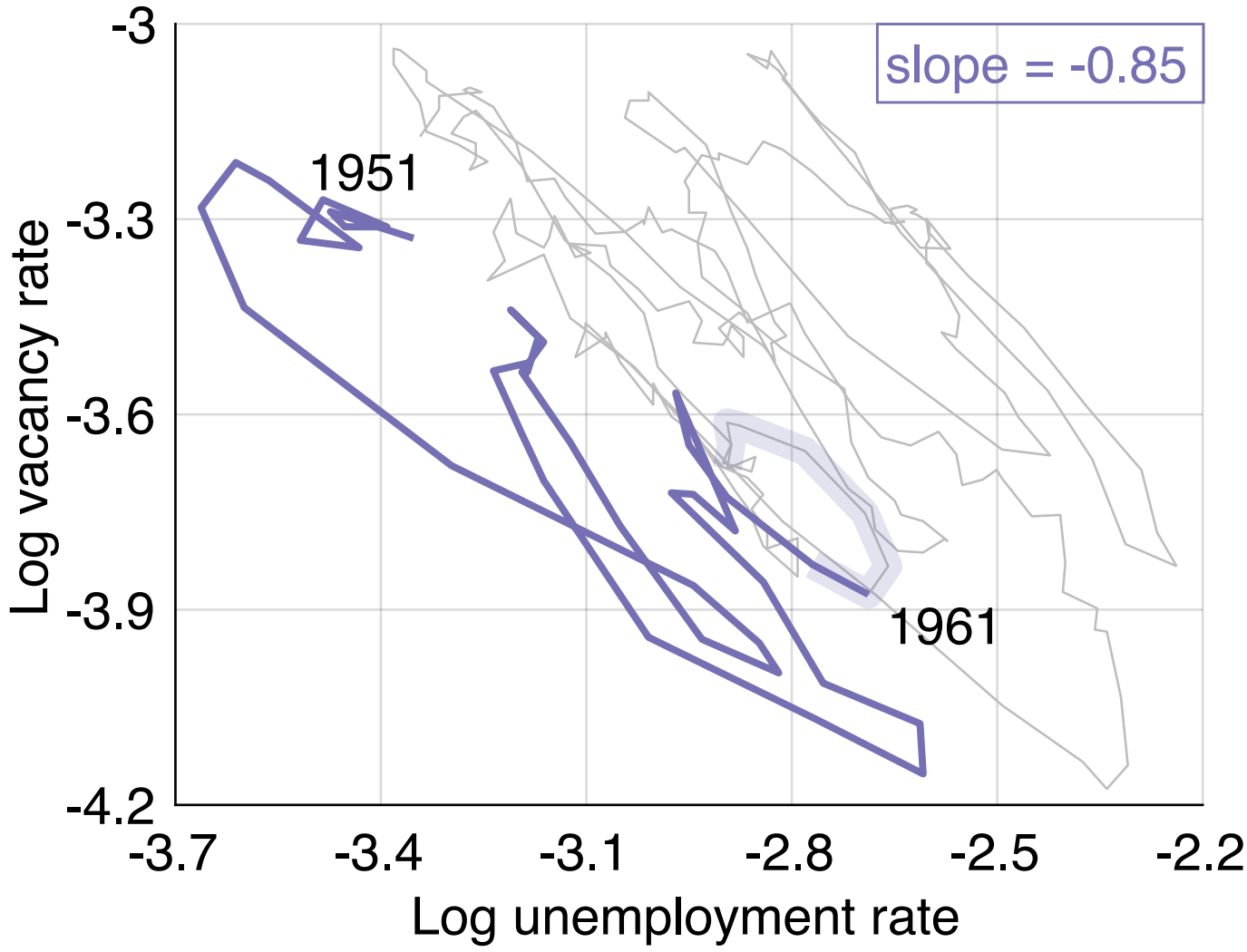


# US BEVERIDGE CURVE ≈ HYPERBOLA



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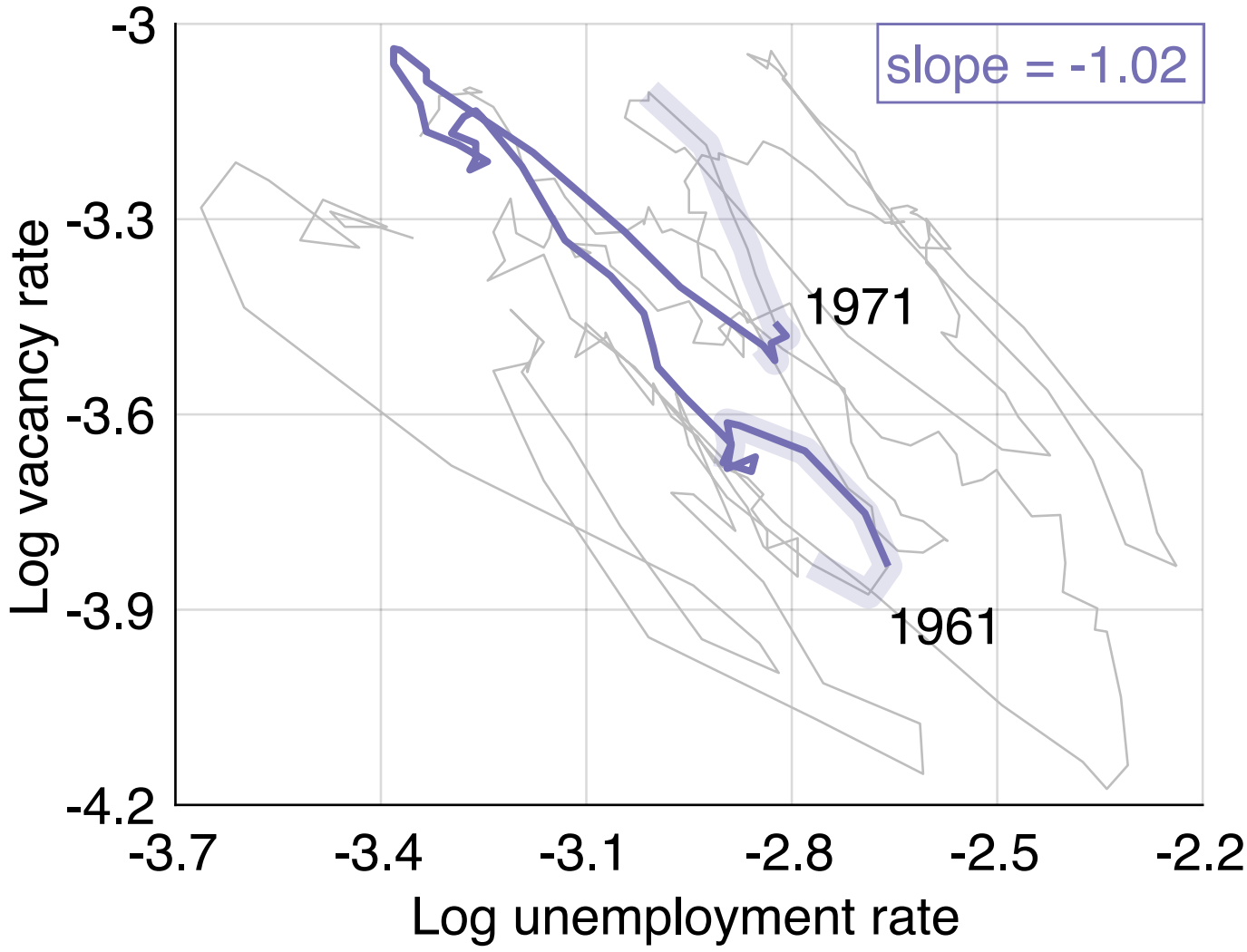

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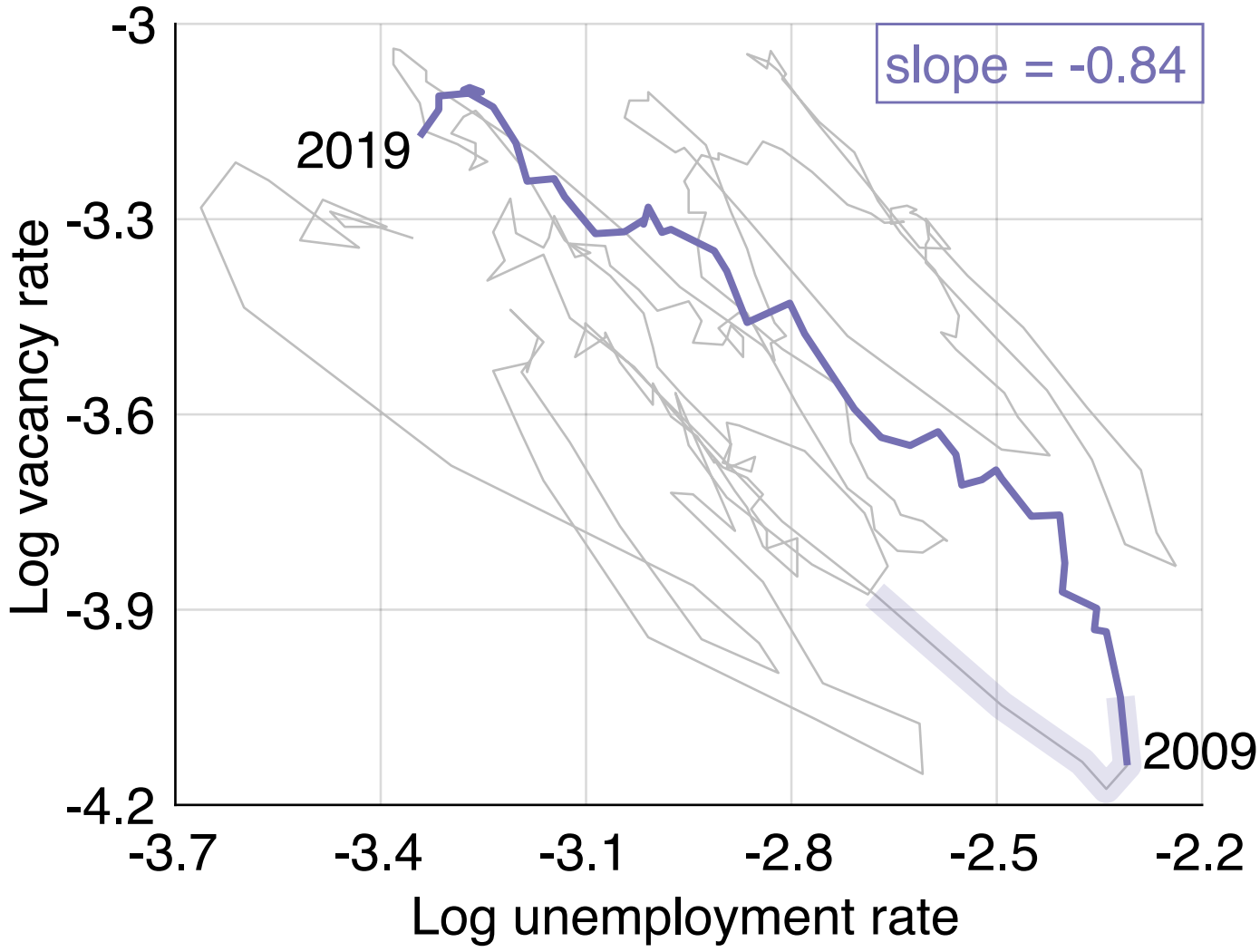


# SOCIAL PLANNER'S PROBLEM

- minimize nonproductive use of labor $u + v$
- subject to hyperbolic Beveridge curve $uv = A$
- unconstrained minimization with convex objective: $u + A/u$
- first-order condition is necessary and sufficient:

$$\frac{d[u + A/u]}{du} = 0 \implies 1 - A/u^2 = 0$$

- optimal unemployment and vacancy rates:

$$u^* = \sqrt{A}$$

# EFFICIENT UNEMPLOYMENT RATE $u^*$

- $u^*$ is geometric average of $u$ and $v$:

$$u^* = \sqrt{uv}$$

- economy is inefficiently tight when $u < u^*$ or

$$u < v$$

- economy is inefficiently slack when $u > u^*$ or

$$u > v$$

# WELFARE FOUNDATION FOR OLD INTUITION THAT FULL EMPLOYMENT OCCURS WHEN $u \approx v$

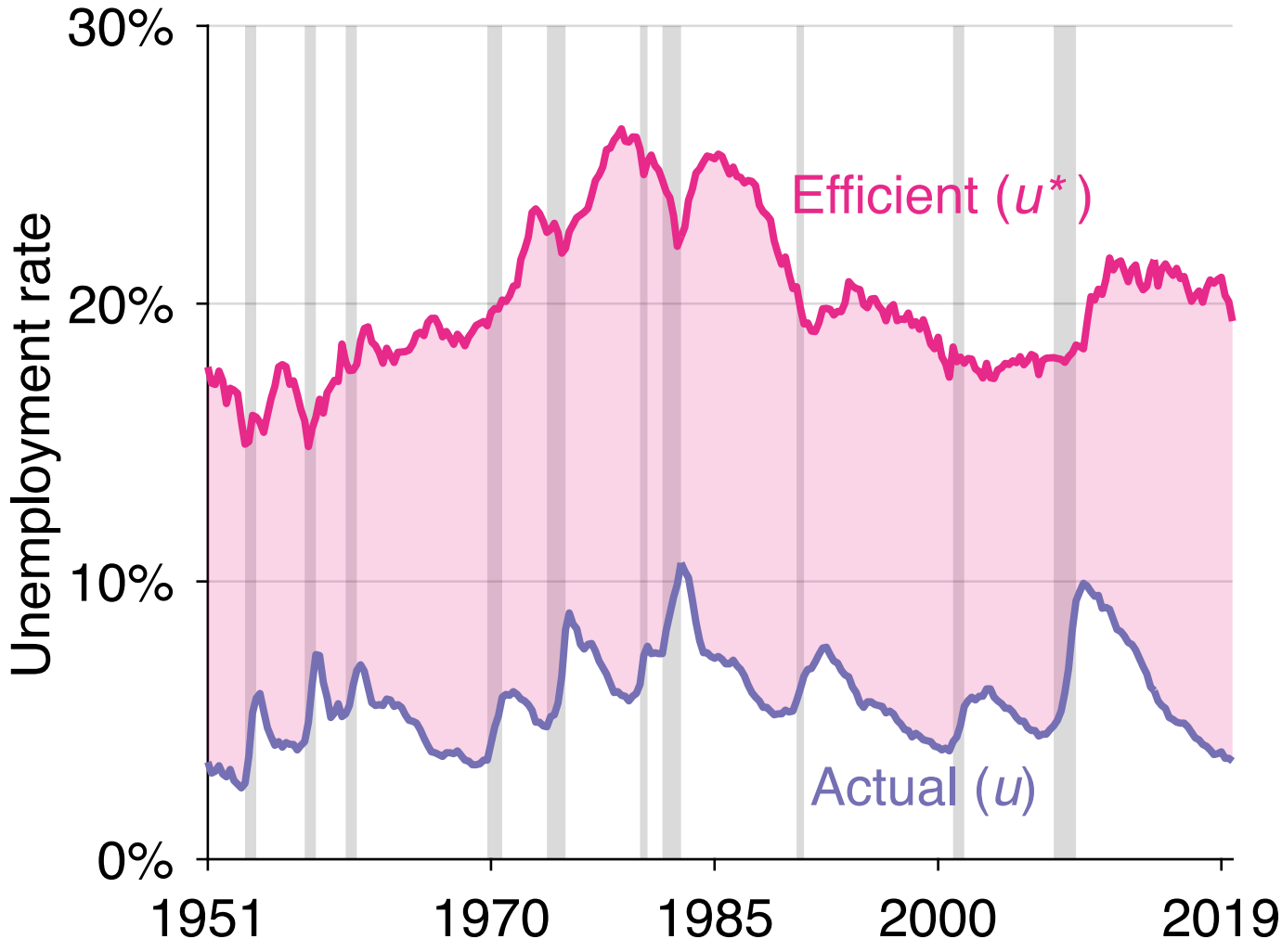
- before Beveridge (1944) report:
  - "Full employment is a state of affairs in which the number of unfilled vacancies is not appreciably below the number of unemployed persons."
- in Beveridge (1944) report:
  - "Full employment means having always more vacant jobs than unemployed men."
- US BLS and Japanese Ministry of Health, Labour, Welfare:
  - flag when # jobseekers per job opening > 1

# GENERALIZATION (MICHAILLAT, SAEZ 2021)

- home production per unemployed worker: $0 \to \zeta$
- # recruiters per vacancy: $1 \to \kappa$
- Beveridge curve: $v = A/u \to v = A/u^{\epsilon}$
- efficient unemployment rate:

$$u^* = \sqrt{uv} \quad \to \quad u^* = \left( \frac{\kappa \cdot \epsilon}{1 - \zeta} \cdot v \cdot u^{\epsilon} \right)^{1/(1+\epsilon)}$$

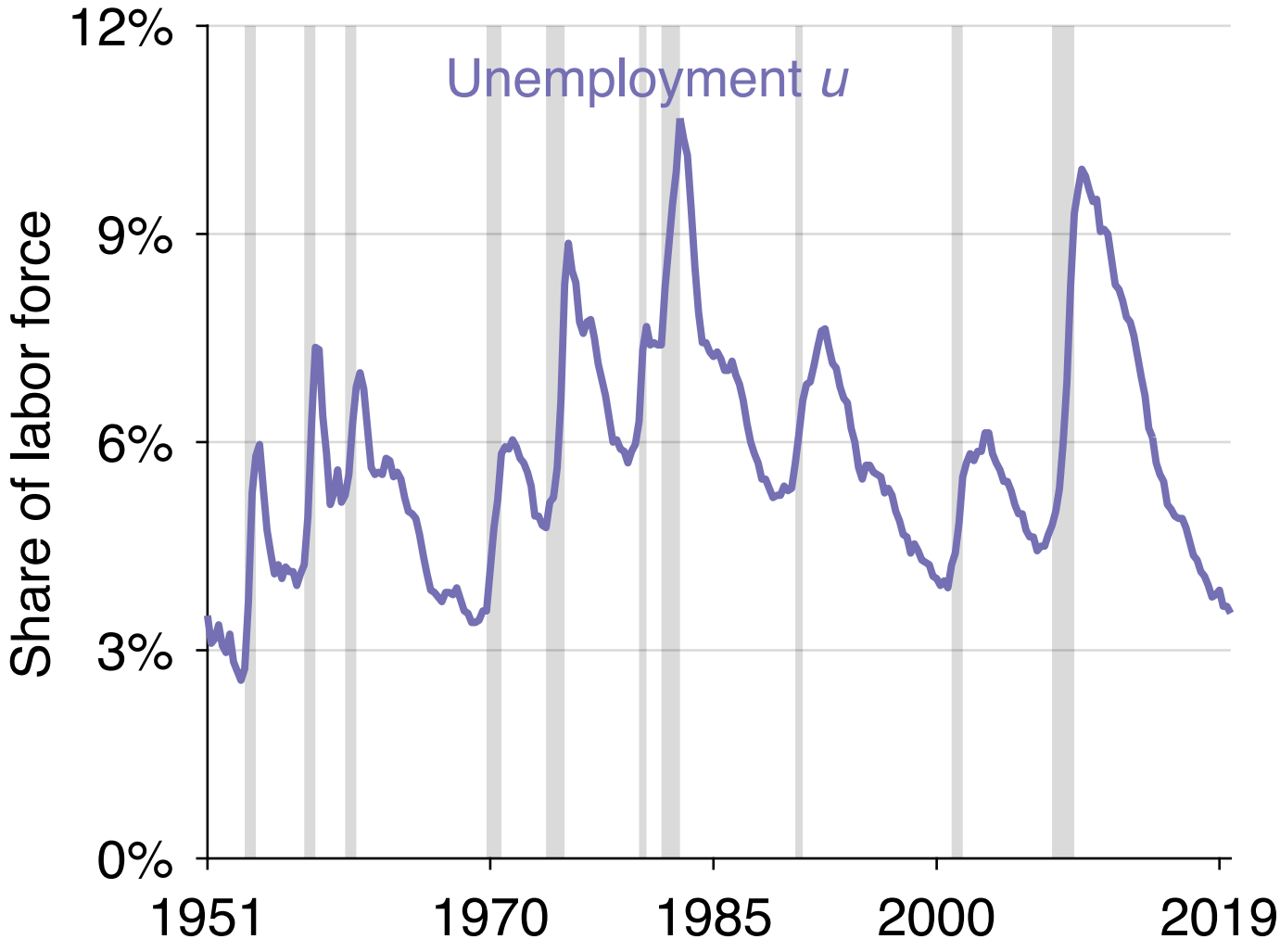
# $u^*$ WITH $\zeta = 0.96$ (HAGEDORN, MANOVSKII 2008)



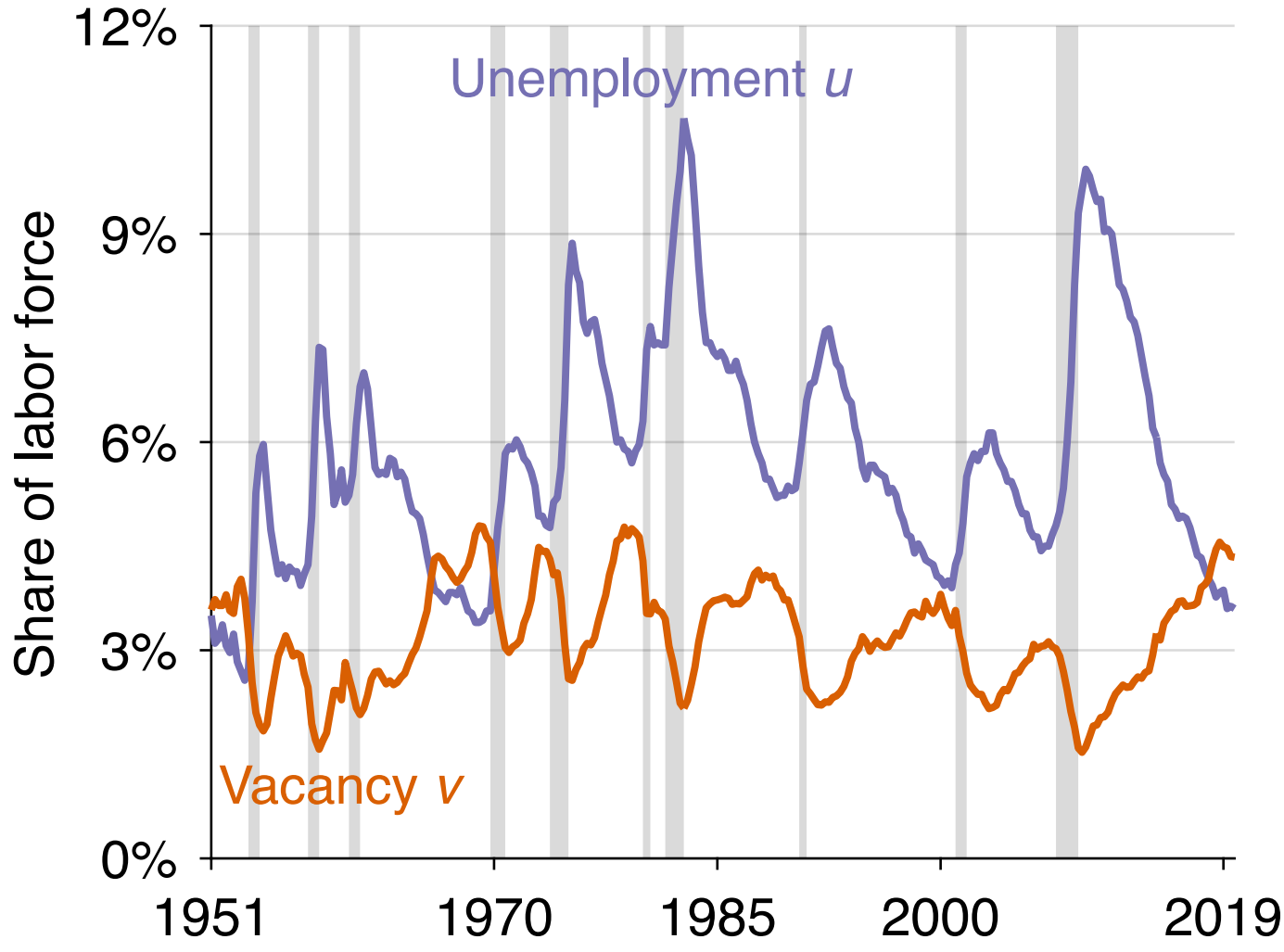
# POSTWAR IN THE UNITED STATES

# (1951–2019)

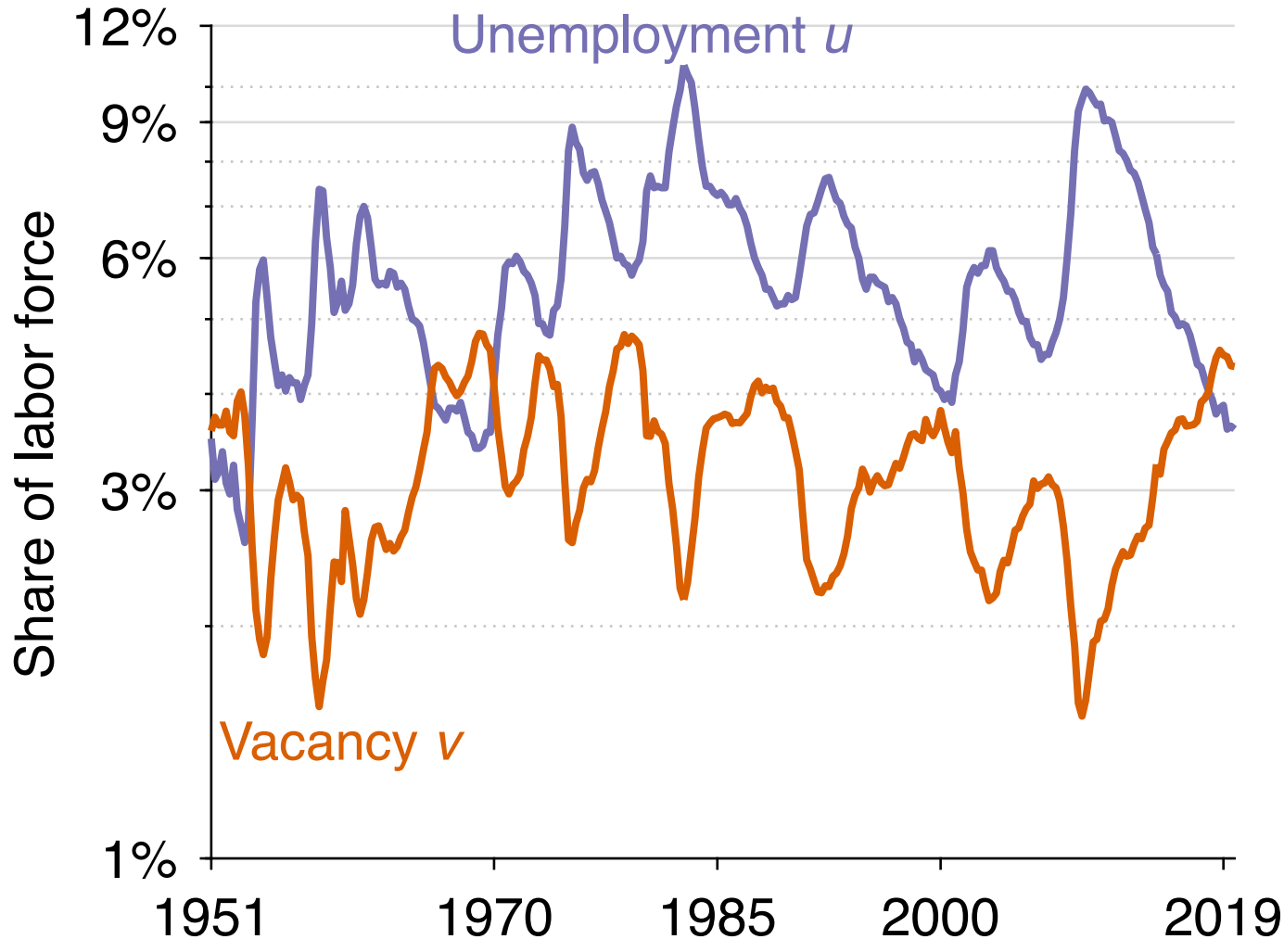
# UNEMPLOYMENT RATE (CPS)



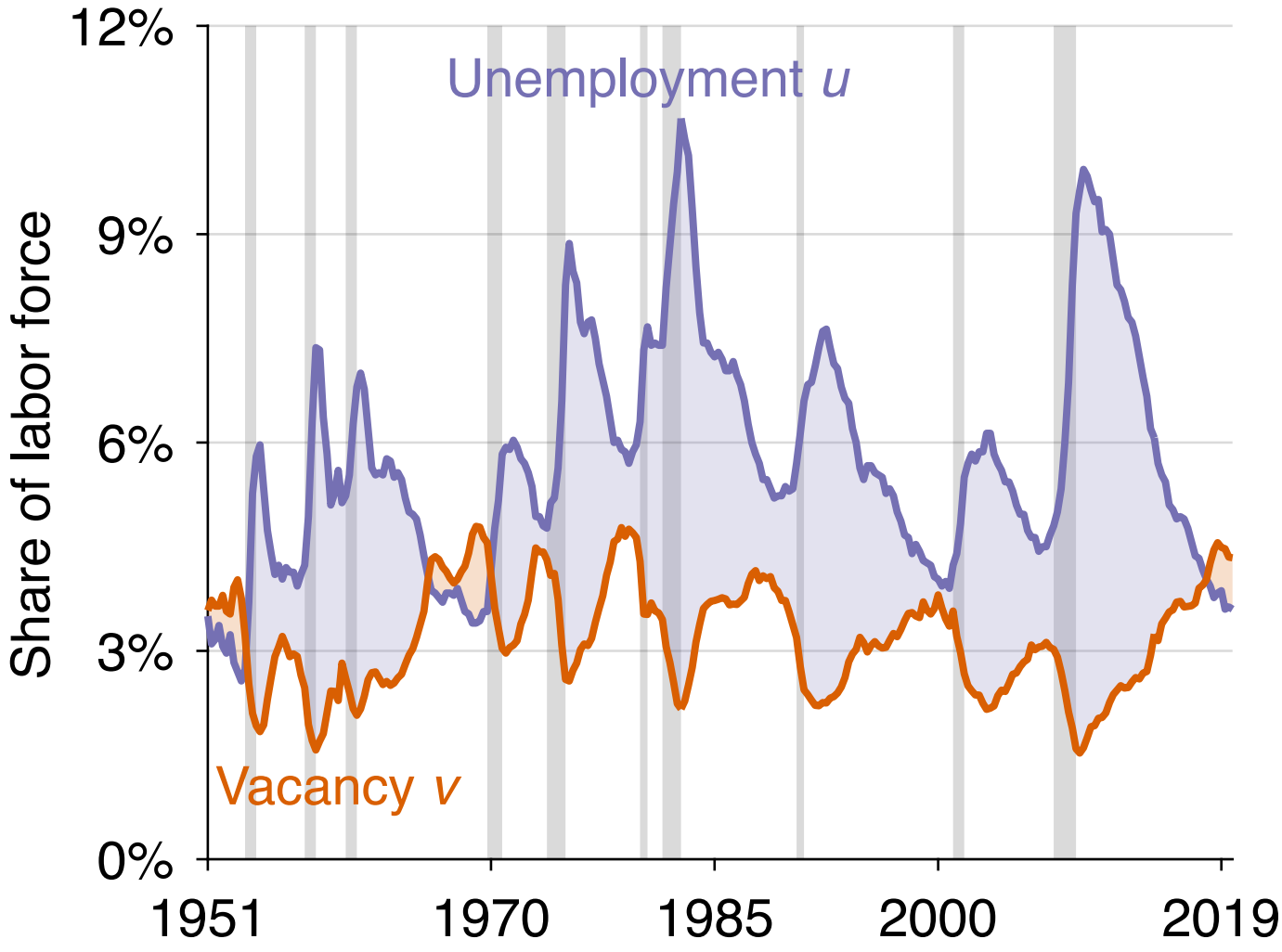
# VACANCY RATE (BARNICHON 2010, JOLTS)



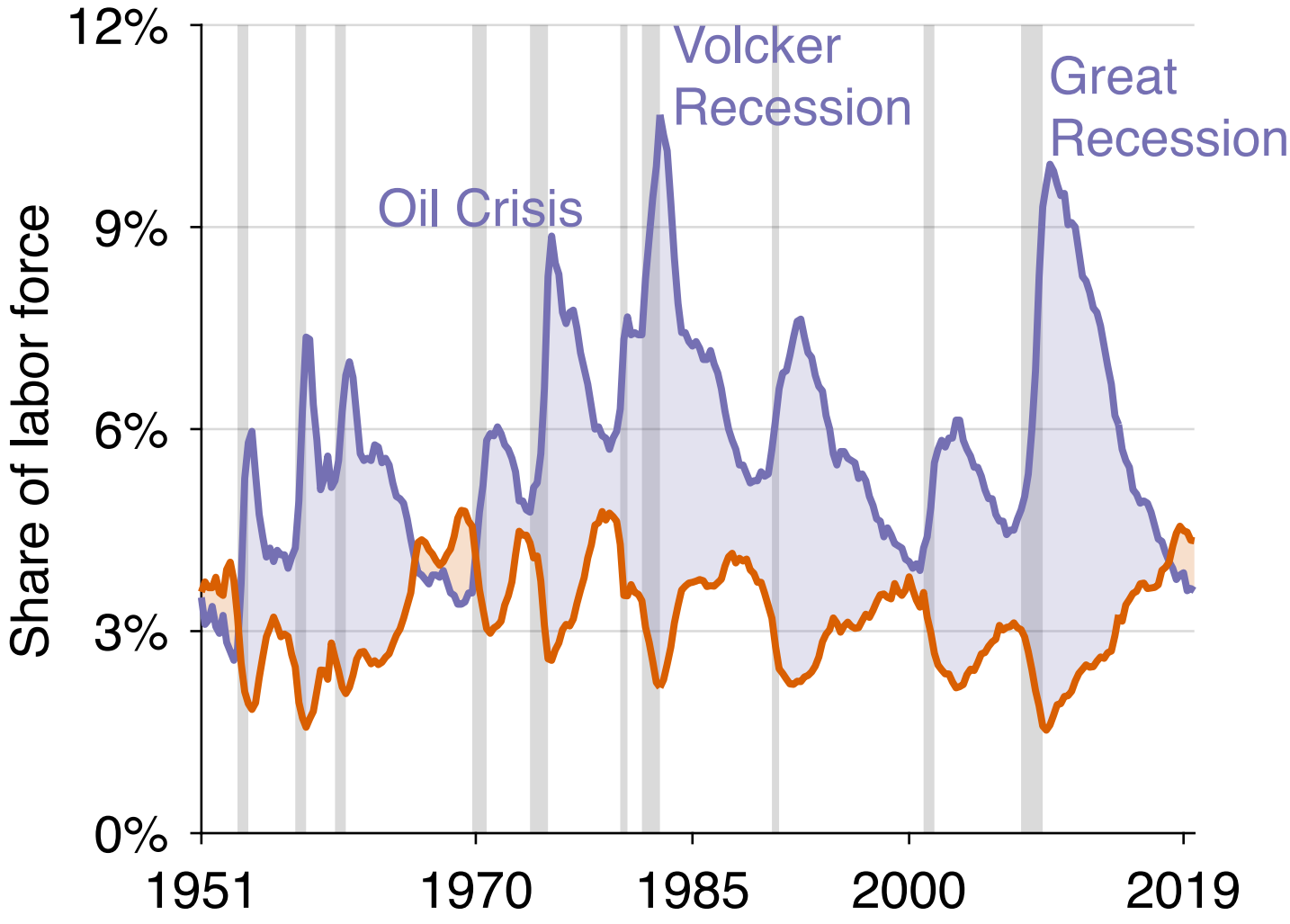
# HYPERBOLIC BEVERIDGE CURVE ON LOG SCALE



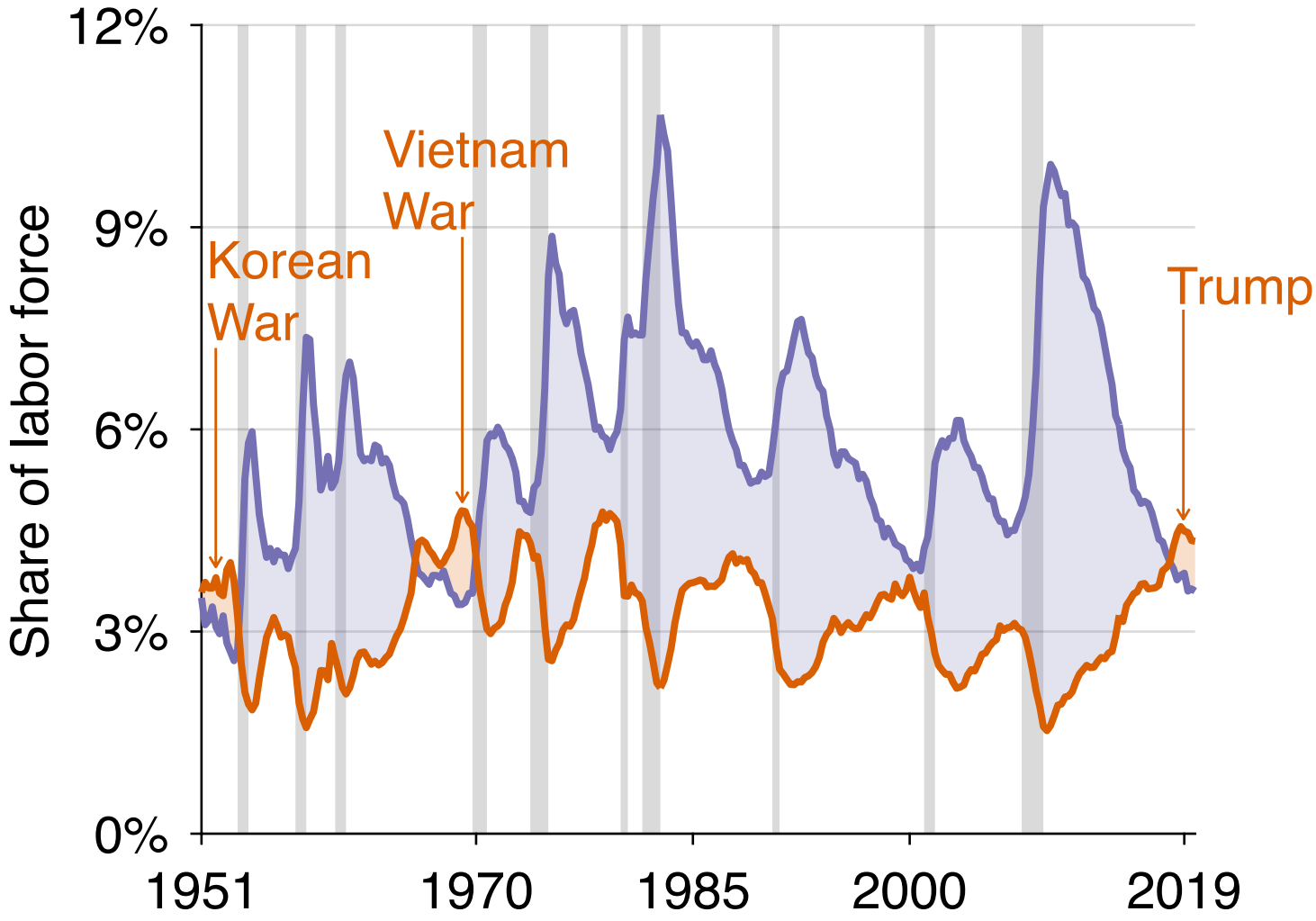
# ECONOMY IS GENERALLY TOO SLACK...



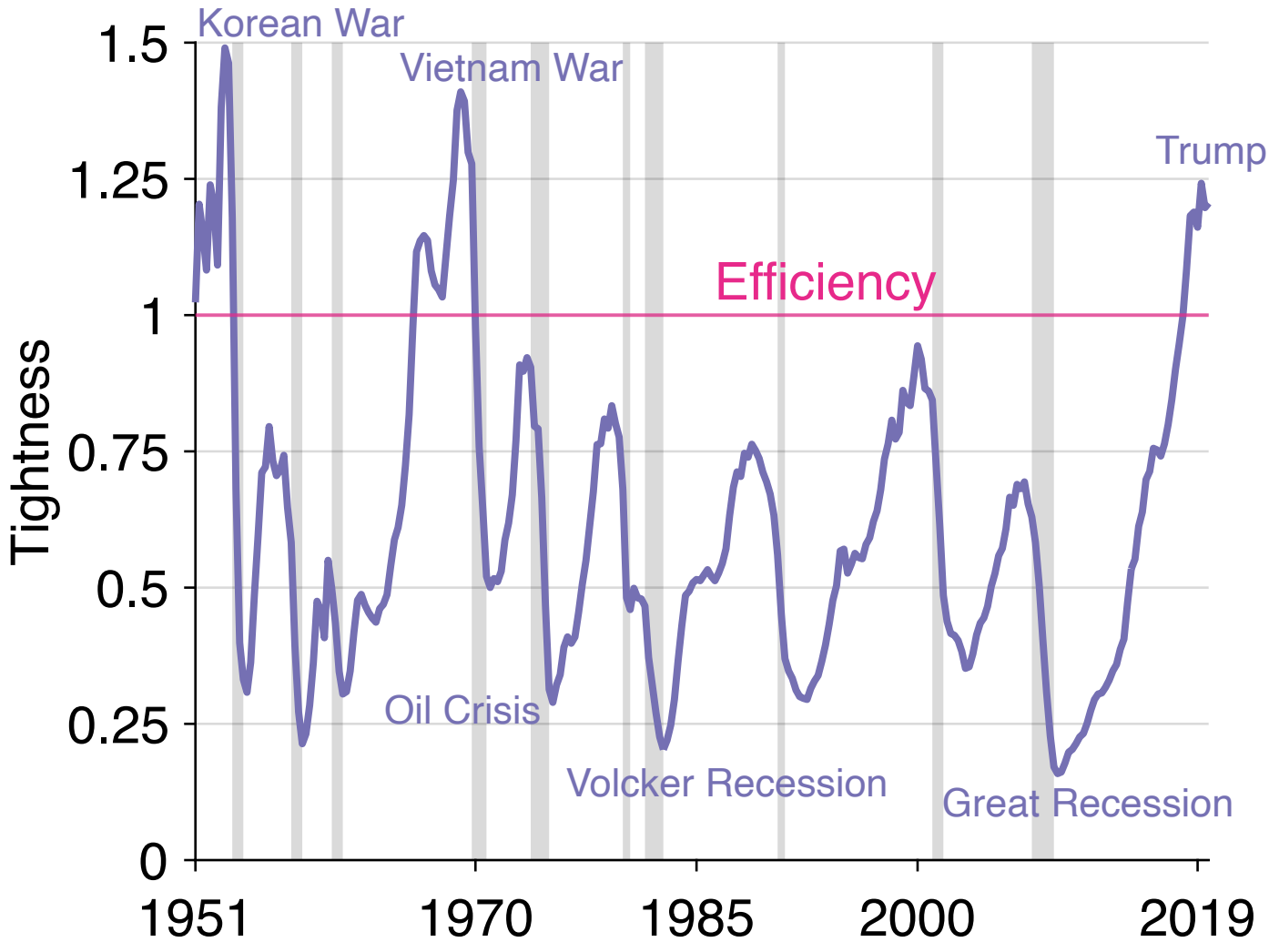
# ... AND IS ESPECIALLY SLACK IN SLUMPS



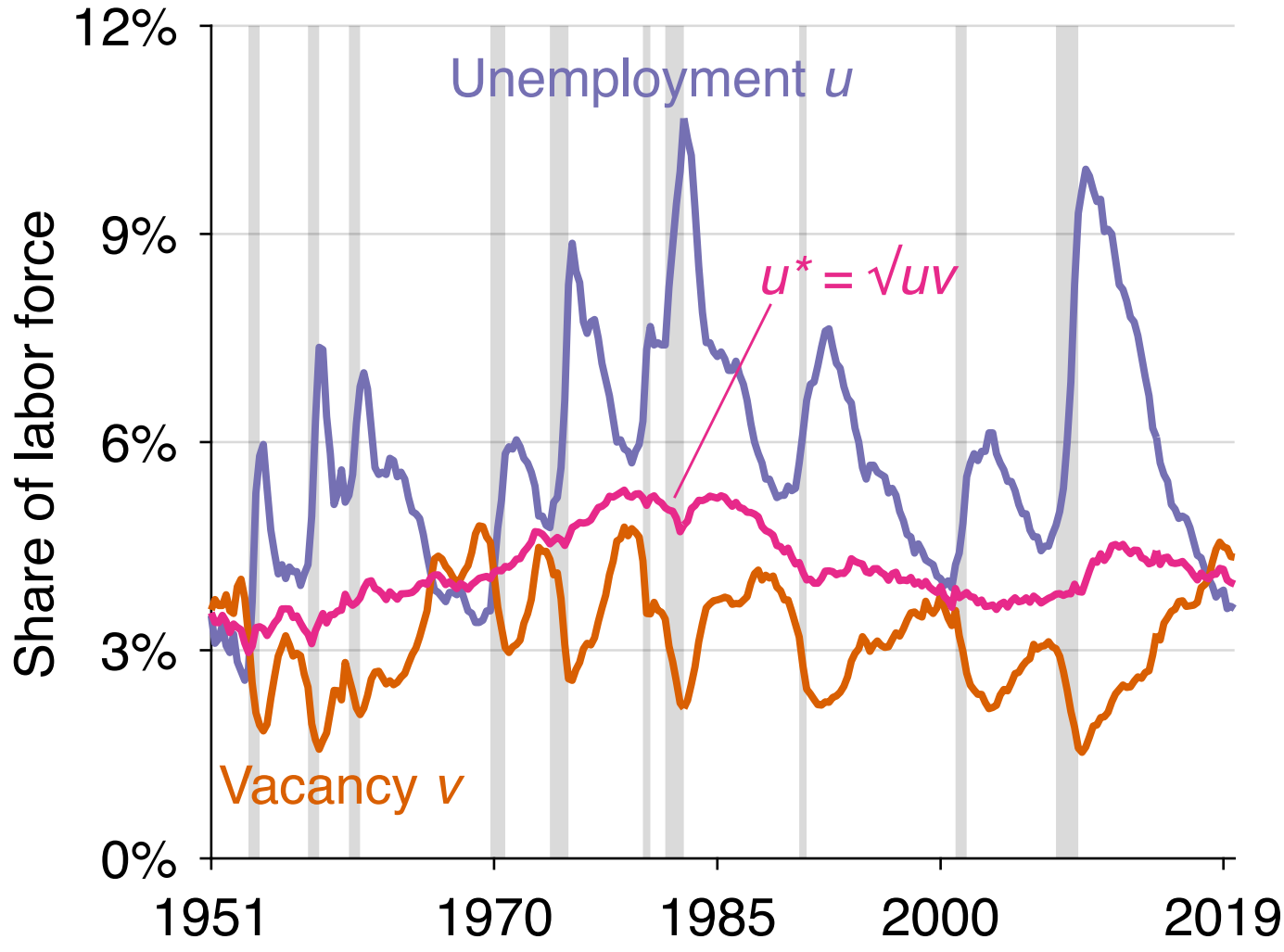
# ECONOMY IS TOO TIGHT DURING WARS



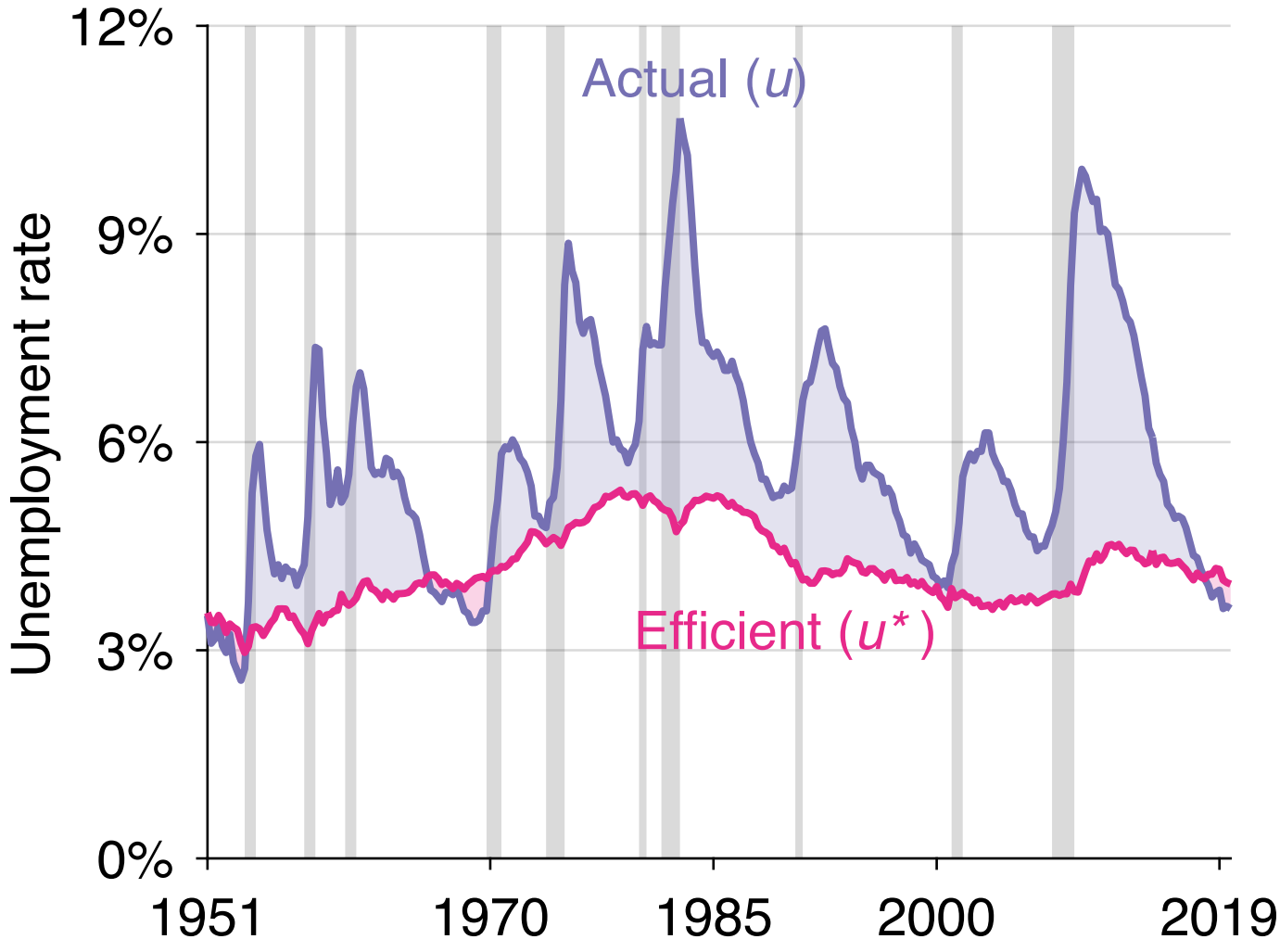
# TIGHTNESS $v/u$ SUMMARIZES STATE OF ECONOMY



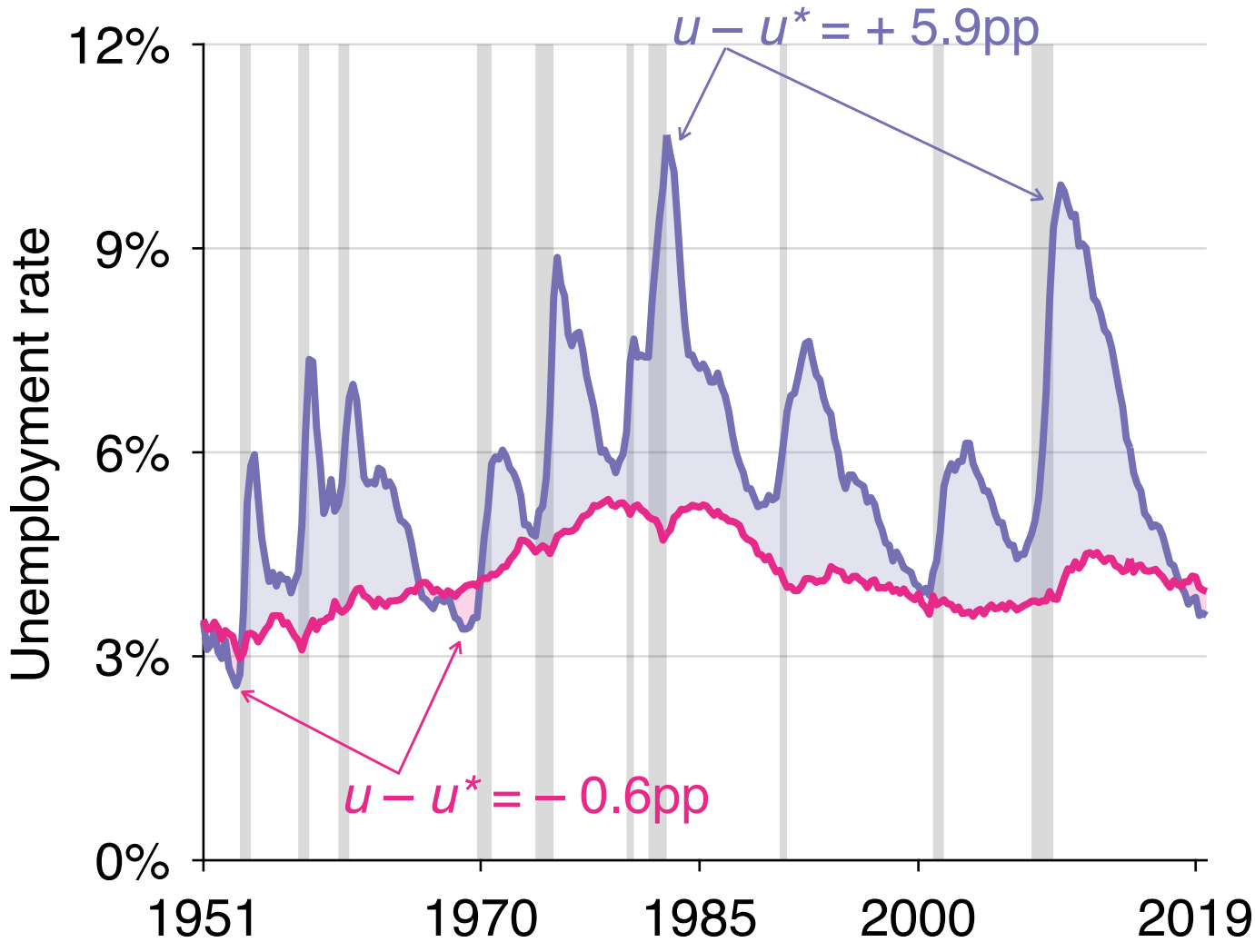
# CONSTRUCTION OF EFFICIENT UNEMPLOYMENT RATE



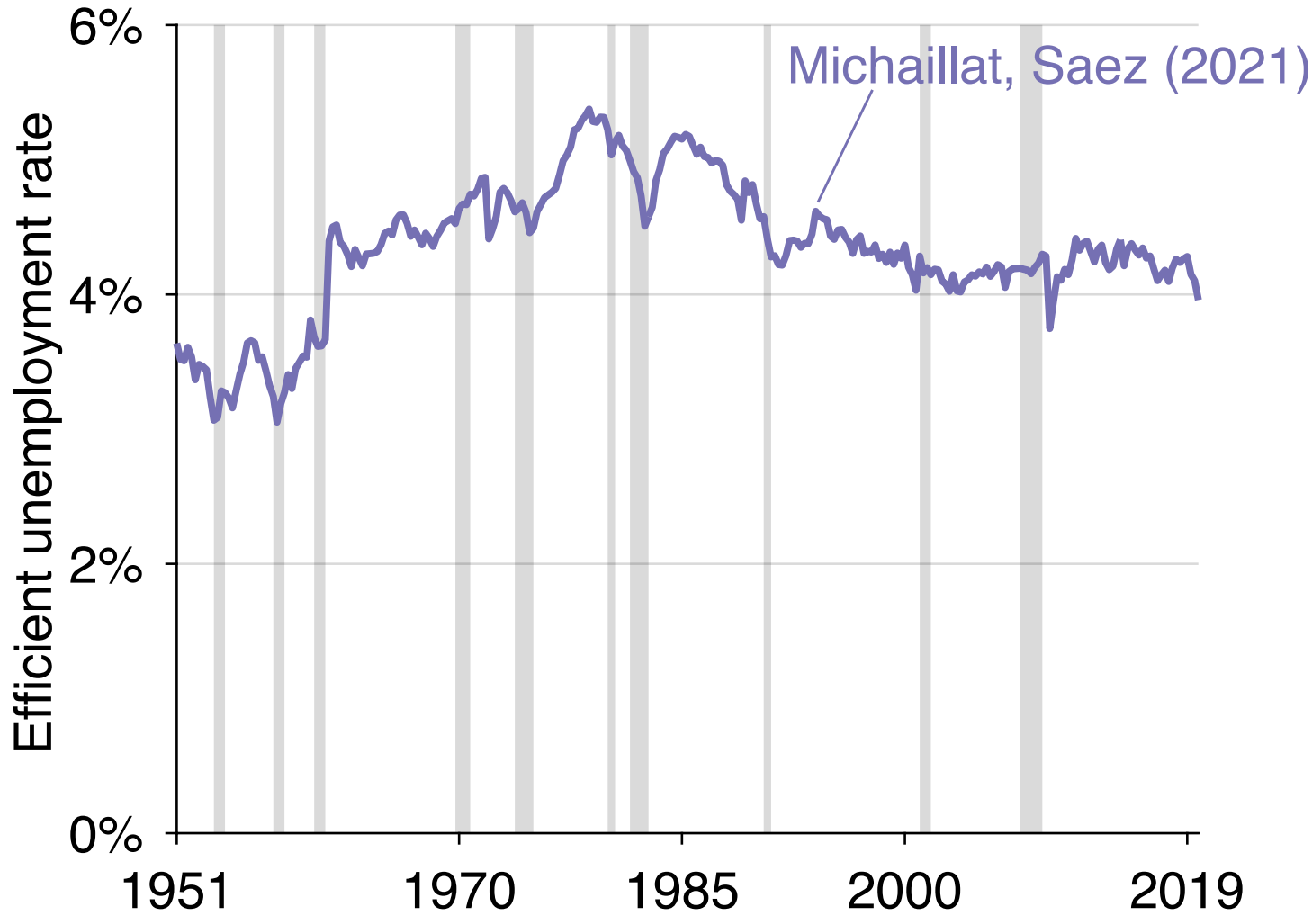
# $u^*$ REMAINS IN 3.0%–5.3%, AVERAGES 4.2%



# UNEMPLOYMENT GAP IS COUNTERCYCLICAL



# COMPARISON WITH MICHAILLAT, SAEZ (2021)



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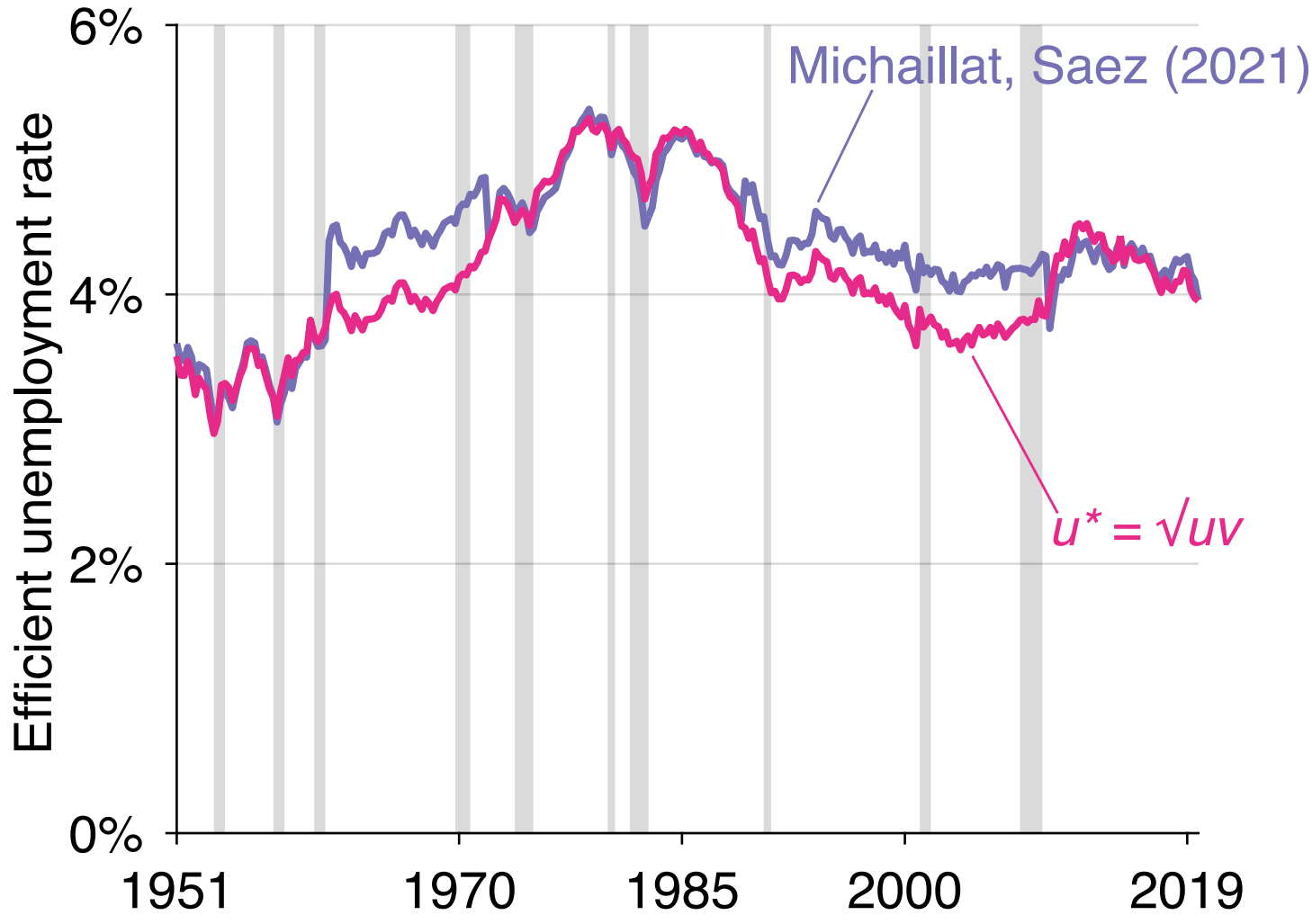
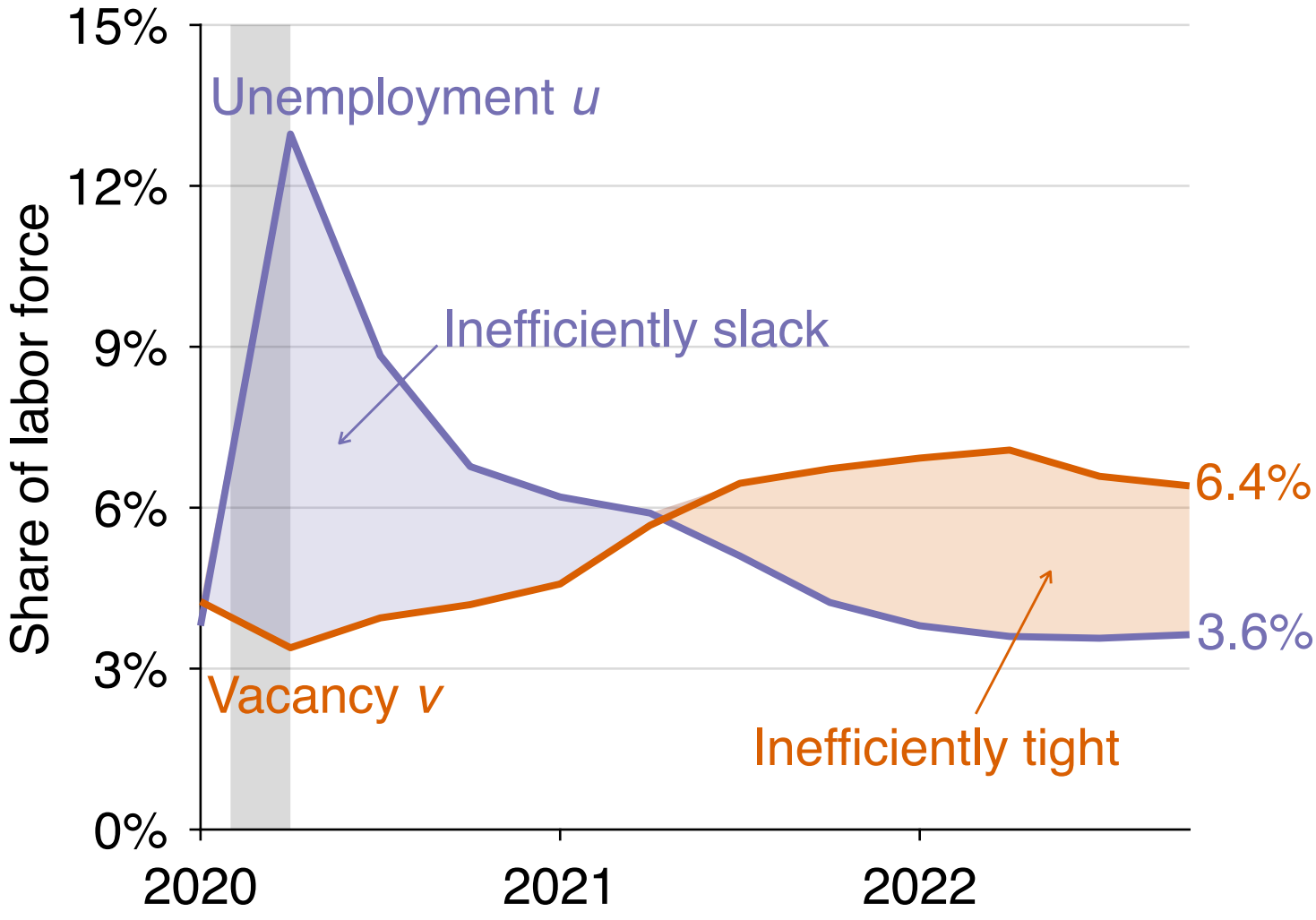


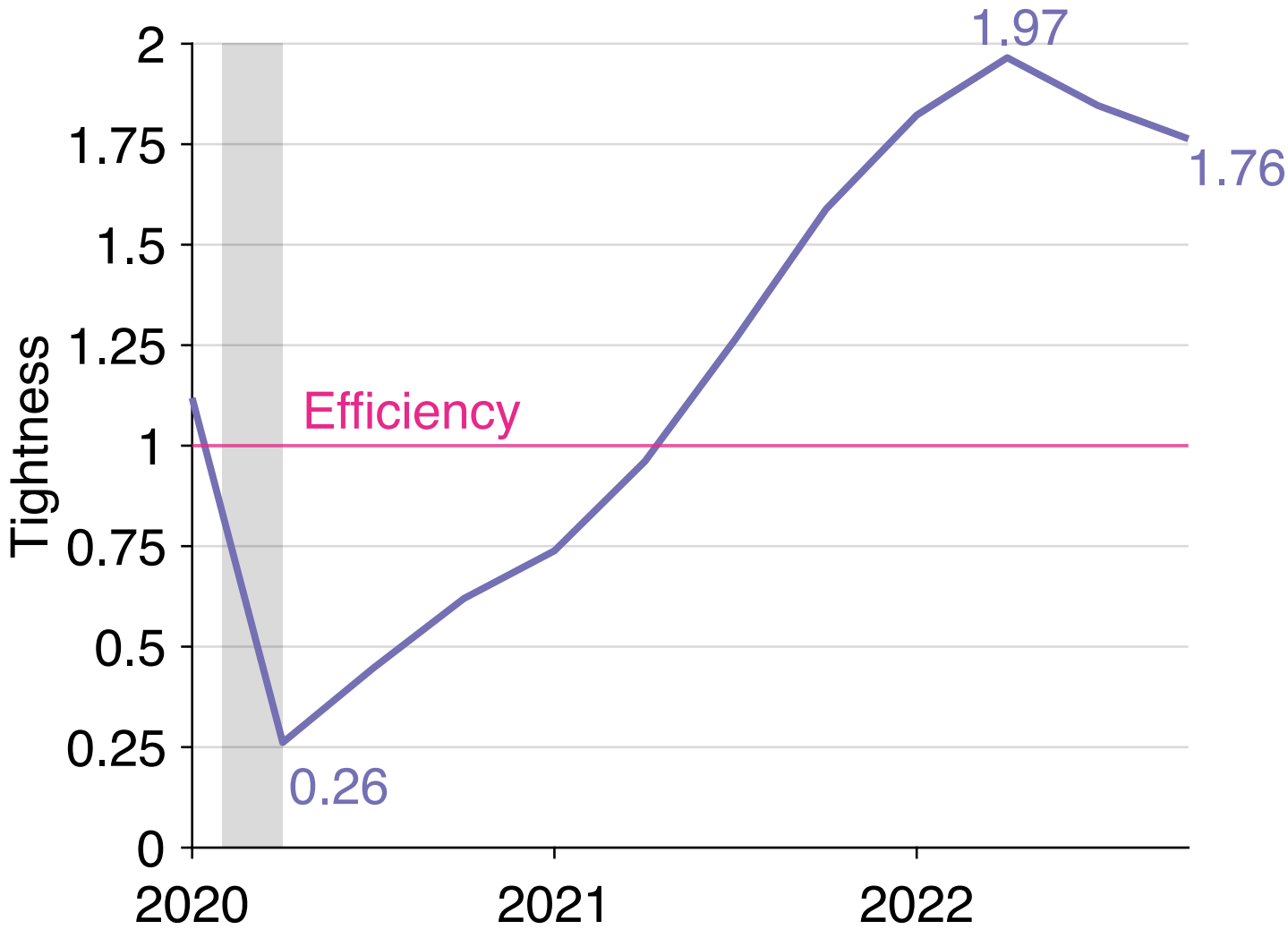
# PANDEMIC IN THE UNITED STATES

# (2020–2022)

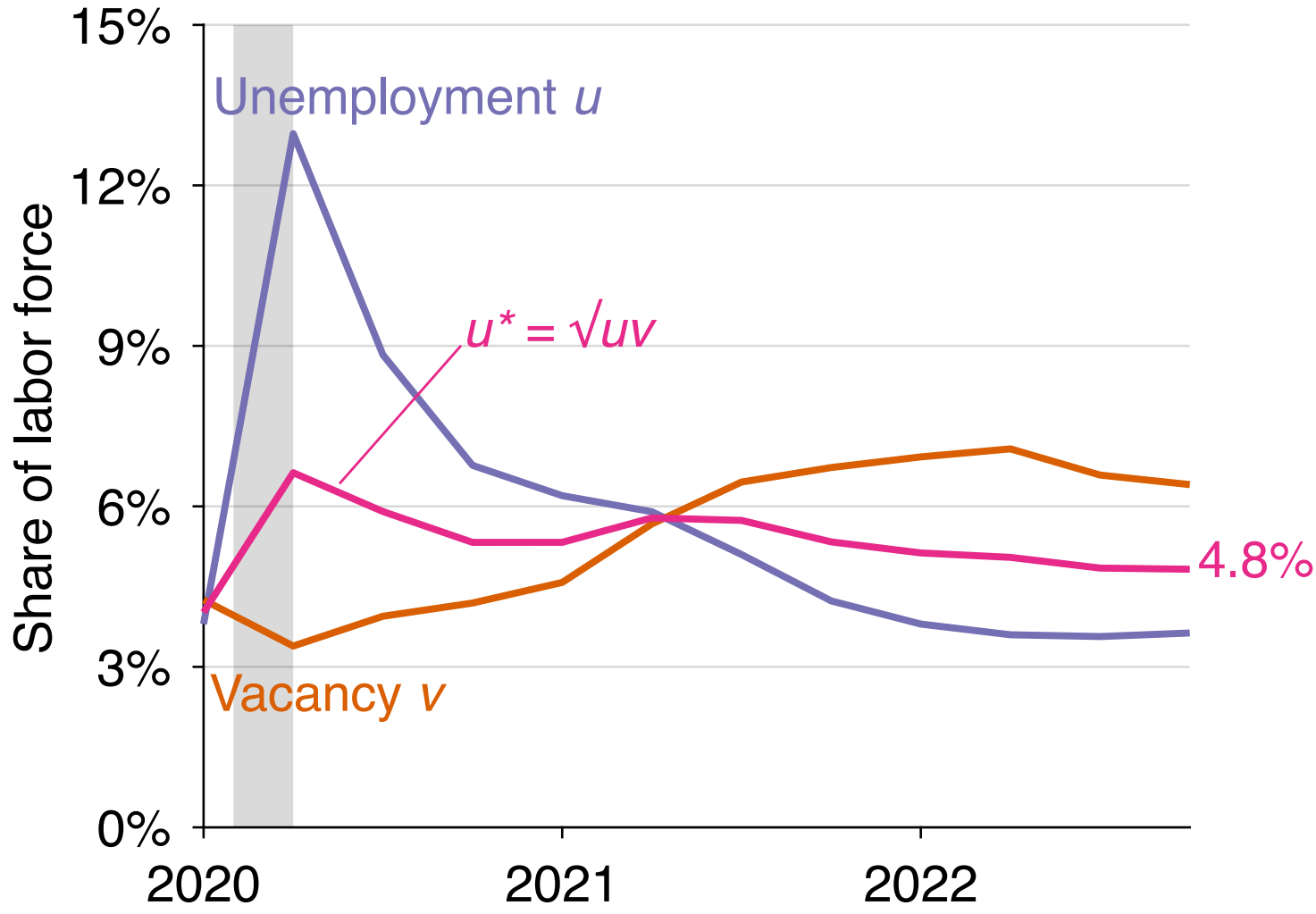
# ECONOMY HAS BEEN TOO TIGHT SINCE 2021Q3



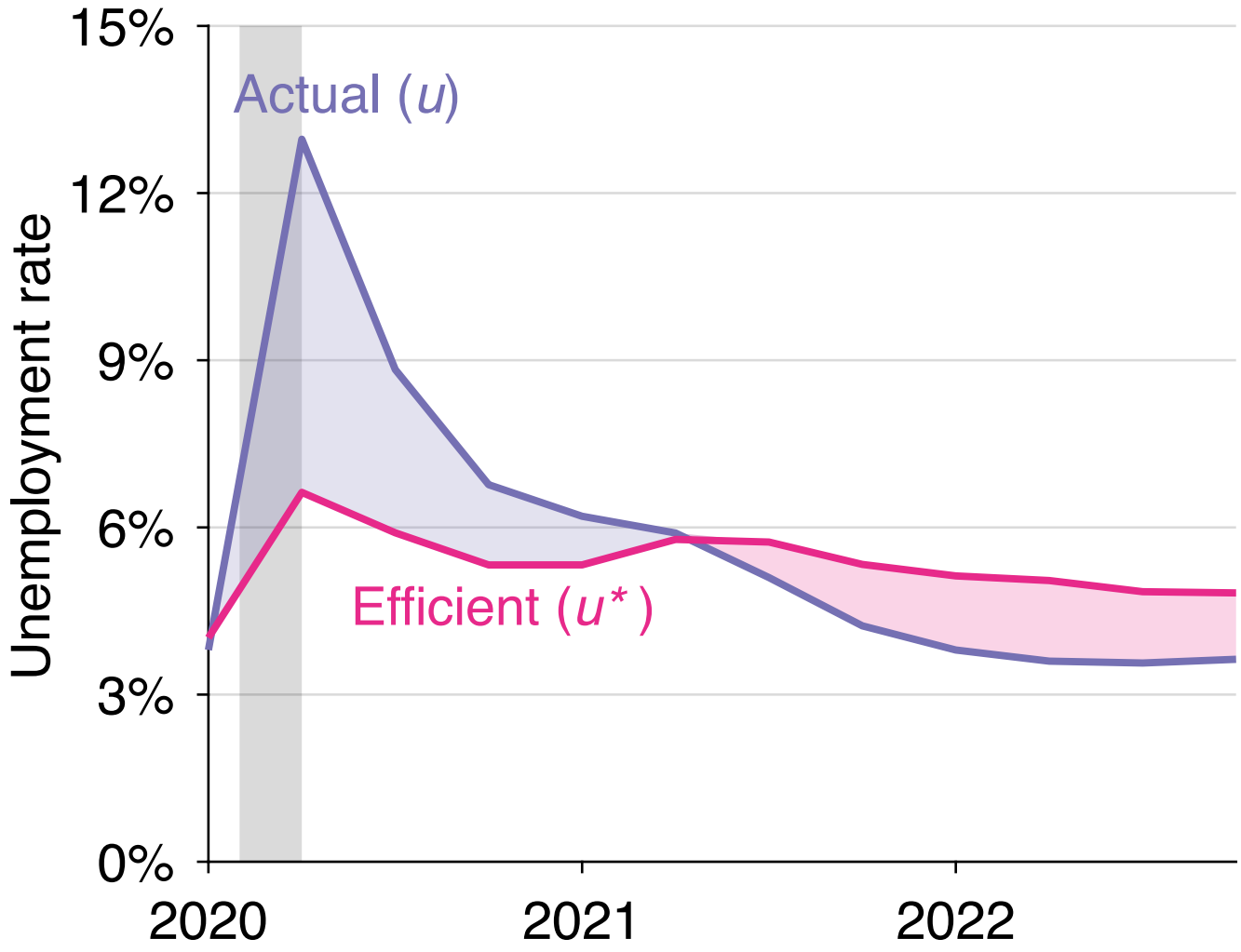
# BUT ECONOMY HAS BEEN COOLING SINCE 2022Q2



# CURRENT TARGET FOR MONETARY POLICY: $u^* = 4.8\%$



# MOST EXTREME UNEMPLOYMENT GAPS SINCE WW2



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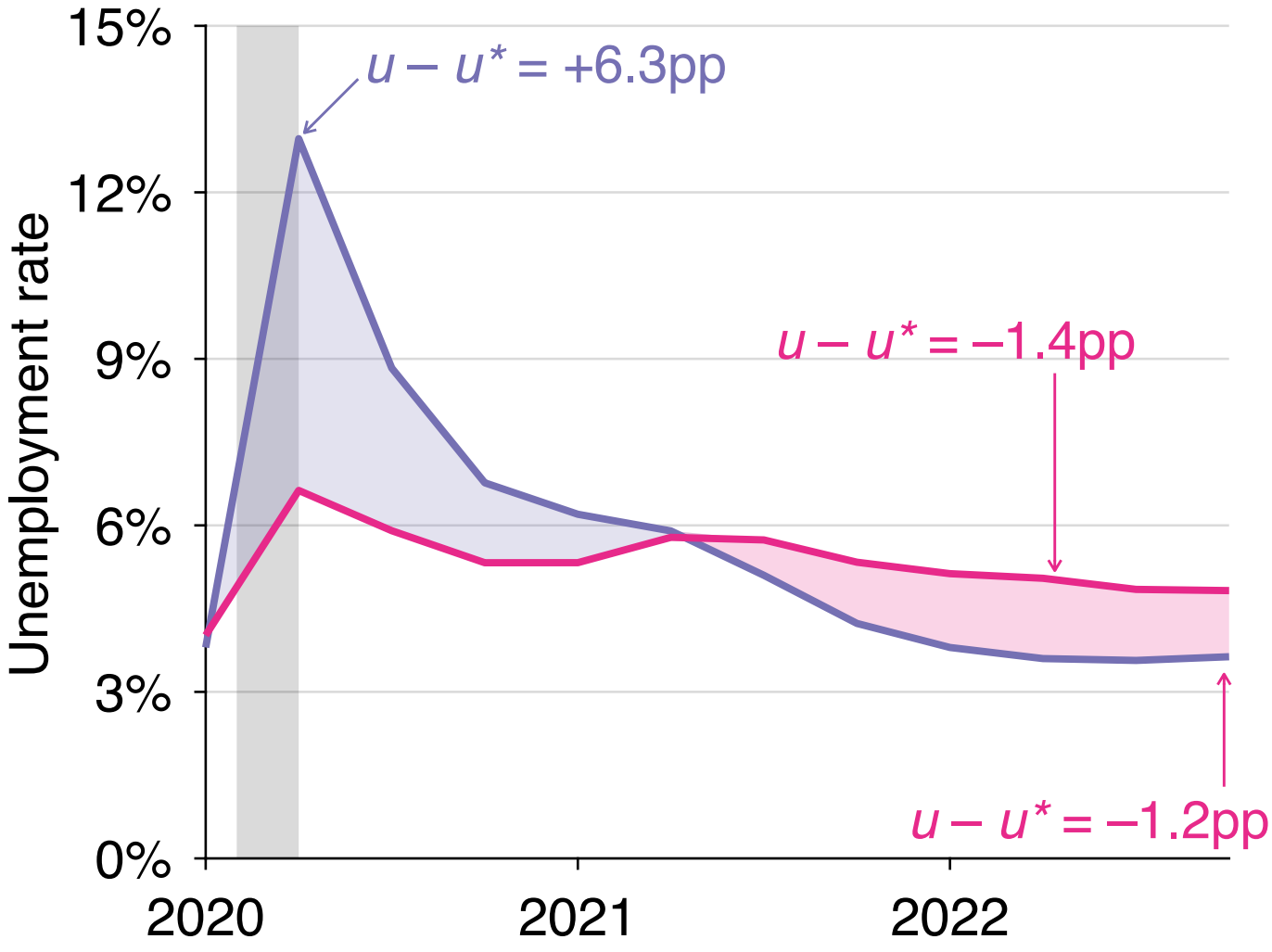
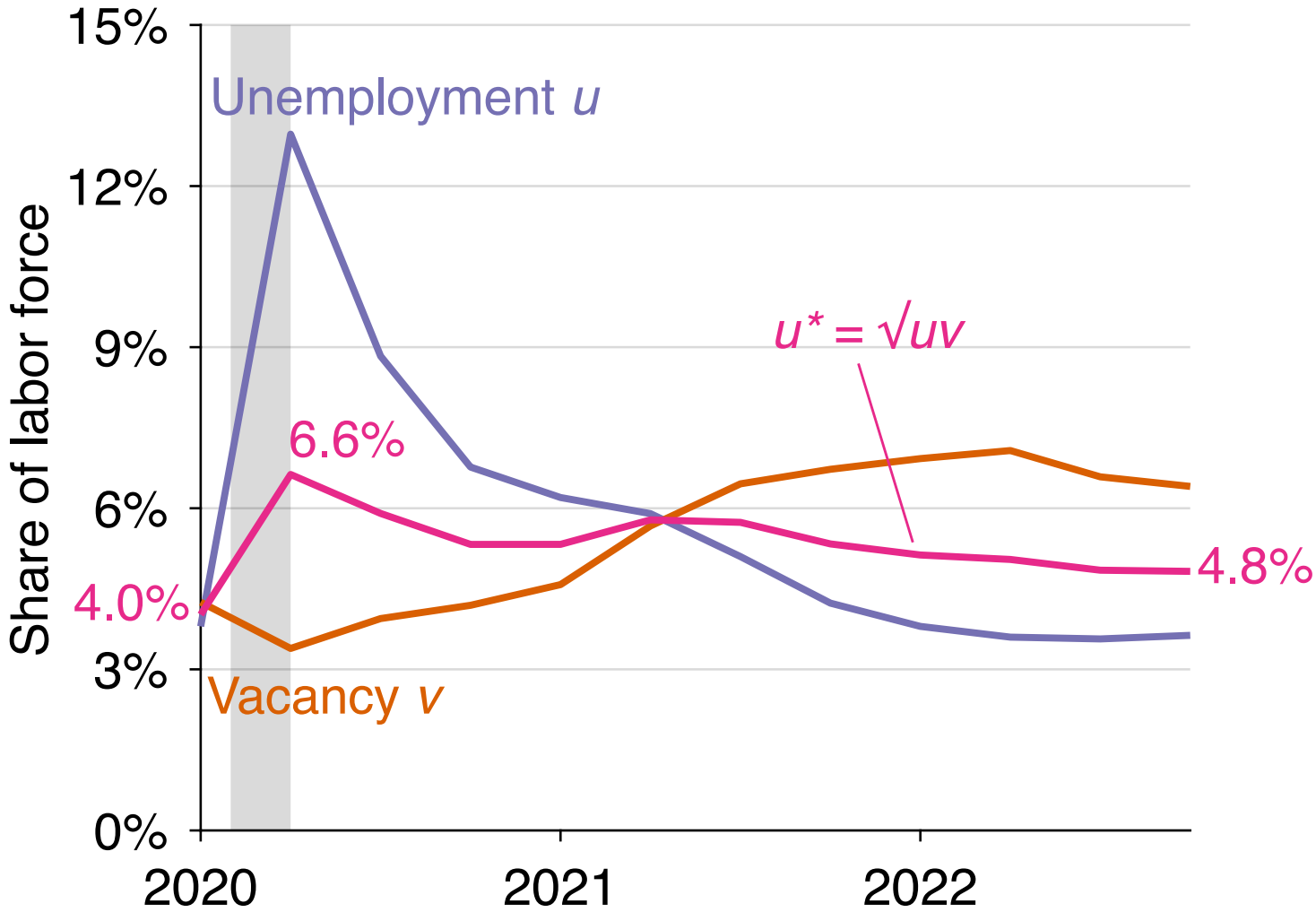


# WHY DID $u^*$ INCREASE SO MUCH IN 2020?



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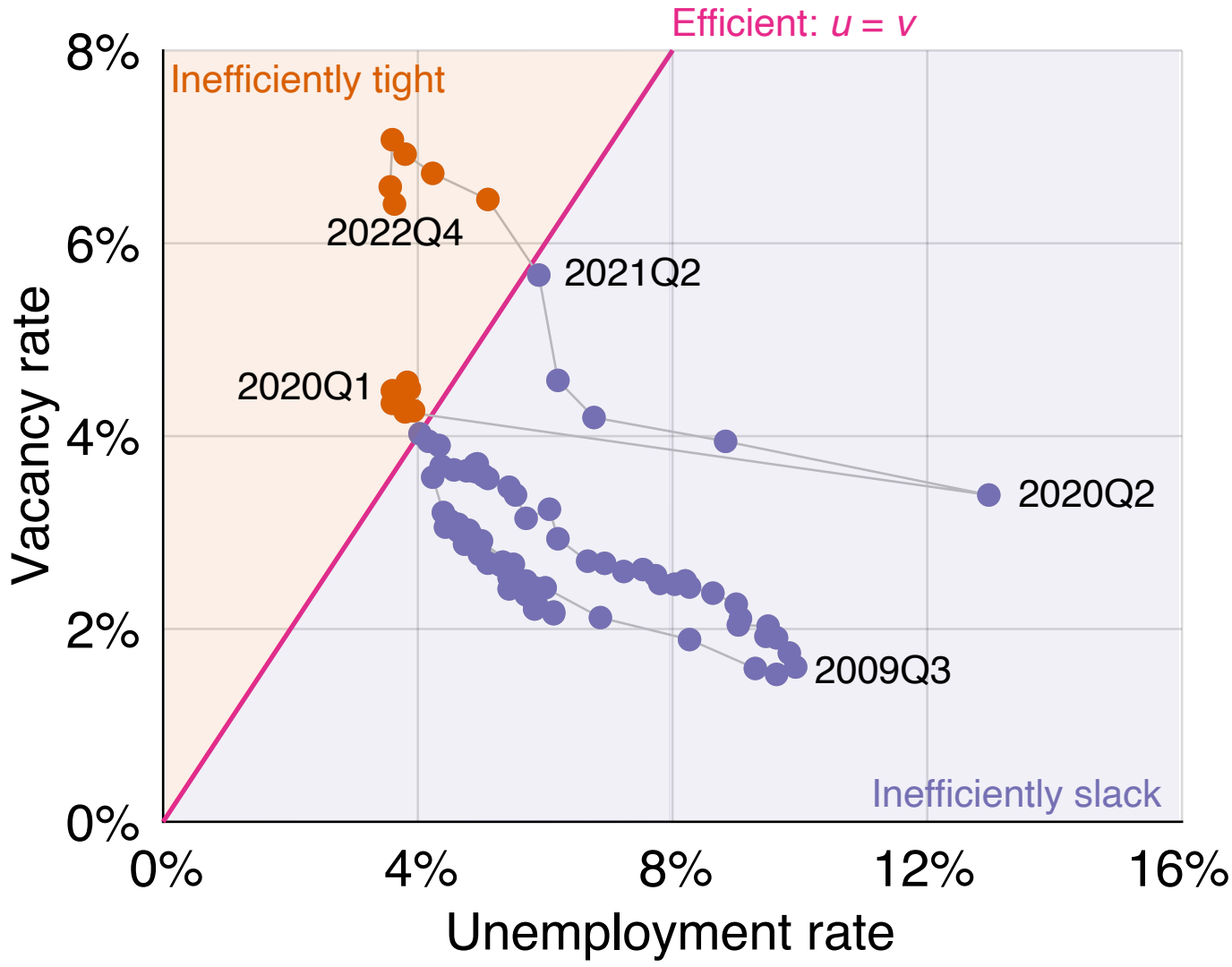
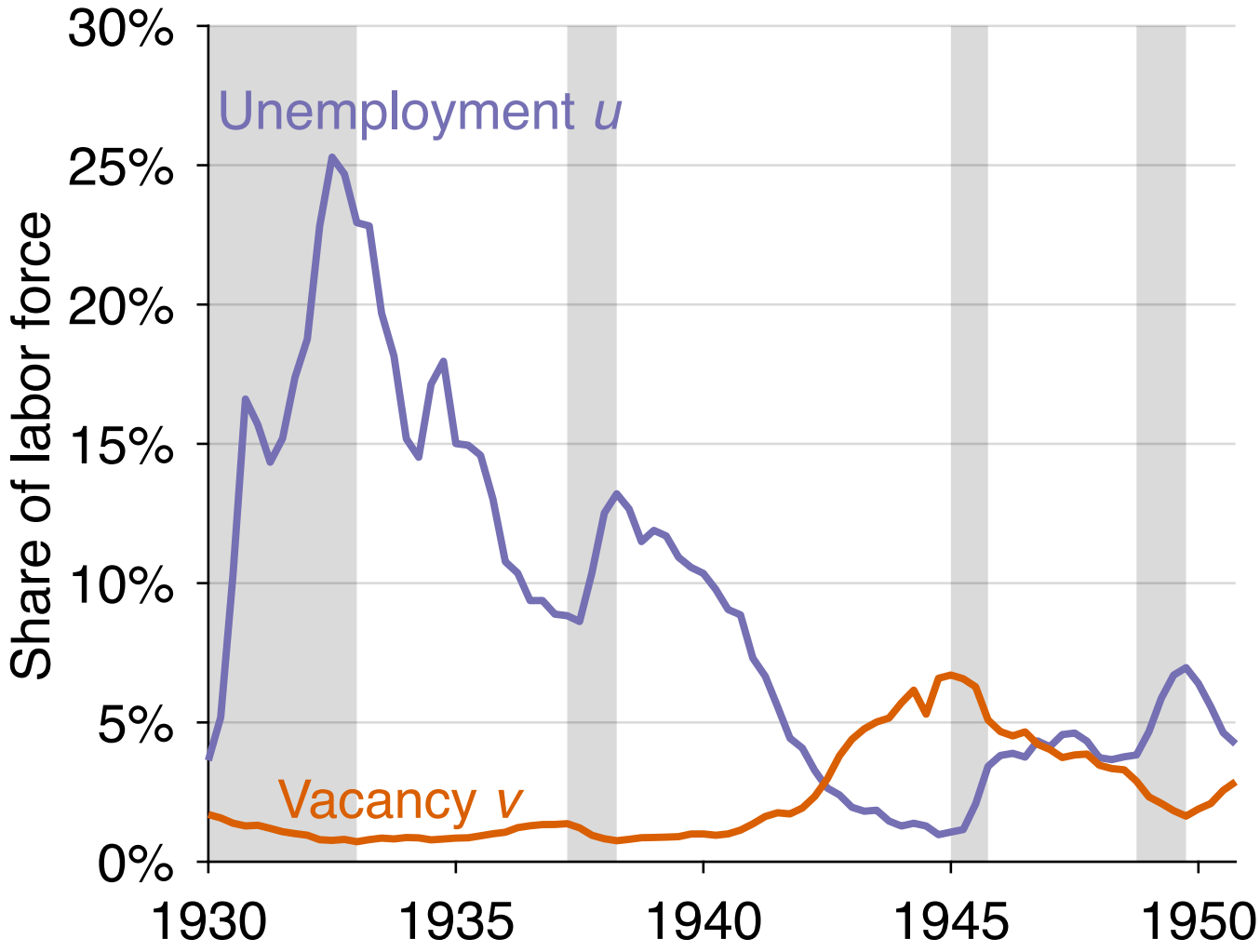
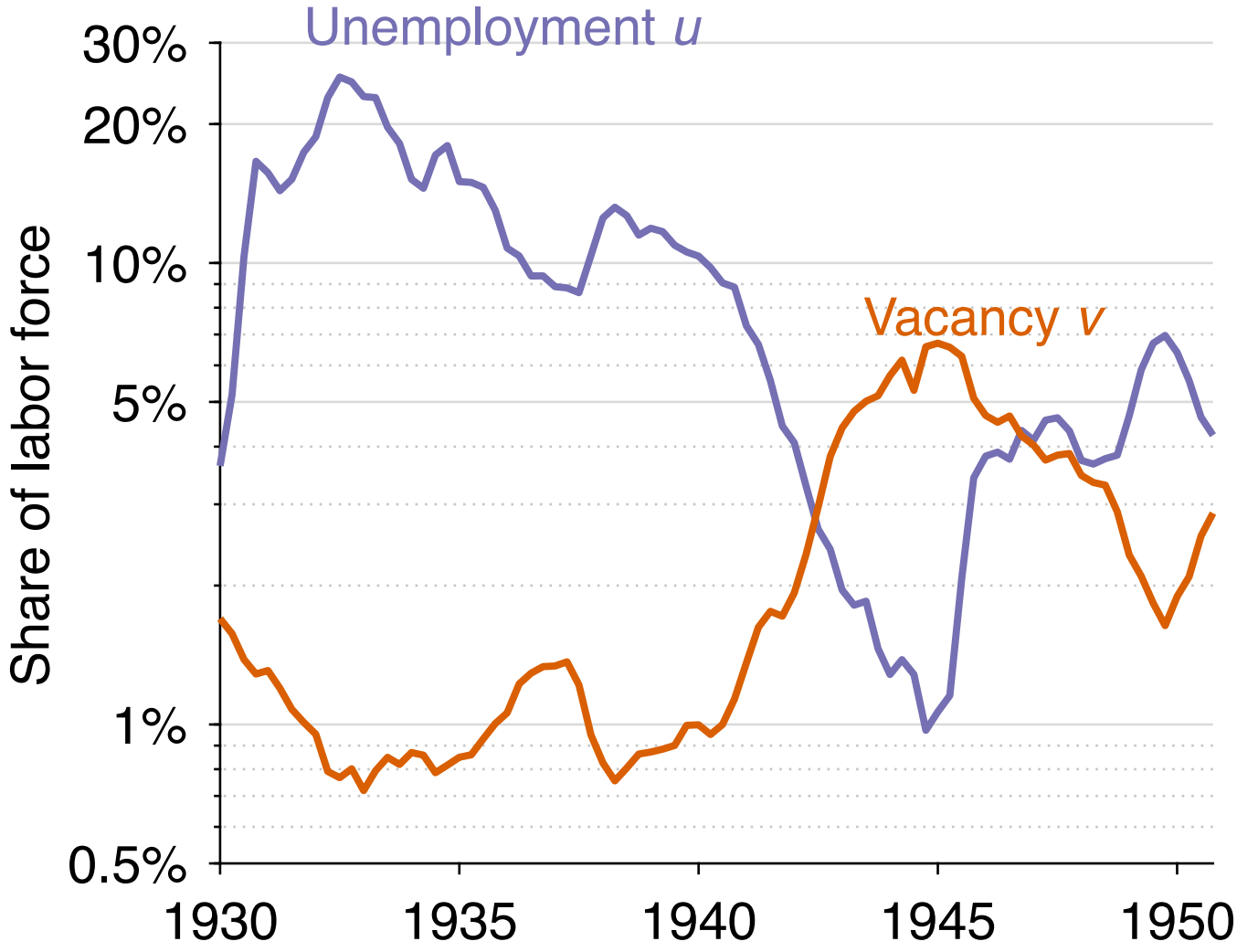


# GREAT DEPRESSION IN THE UNITED STATES (1930–1950)

# NBER DATA (PETROSKY-NADEAU, ZHANG 2021)



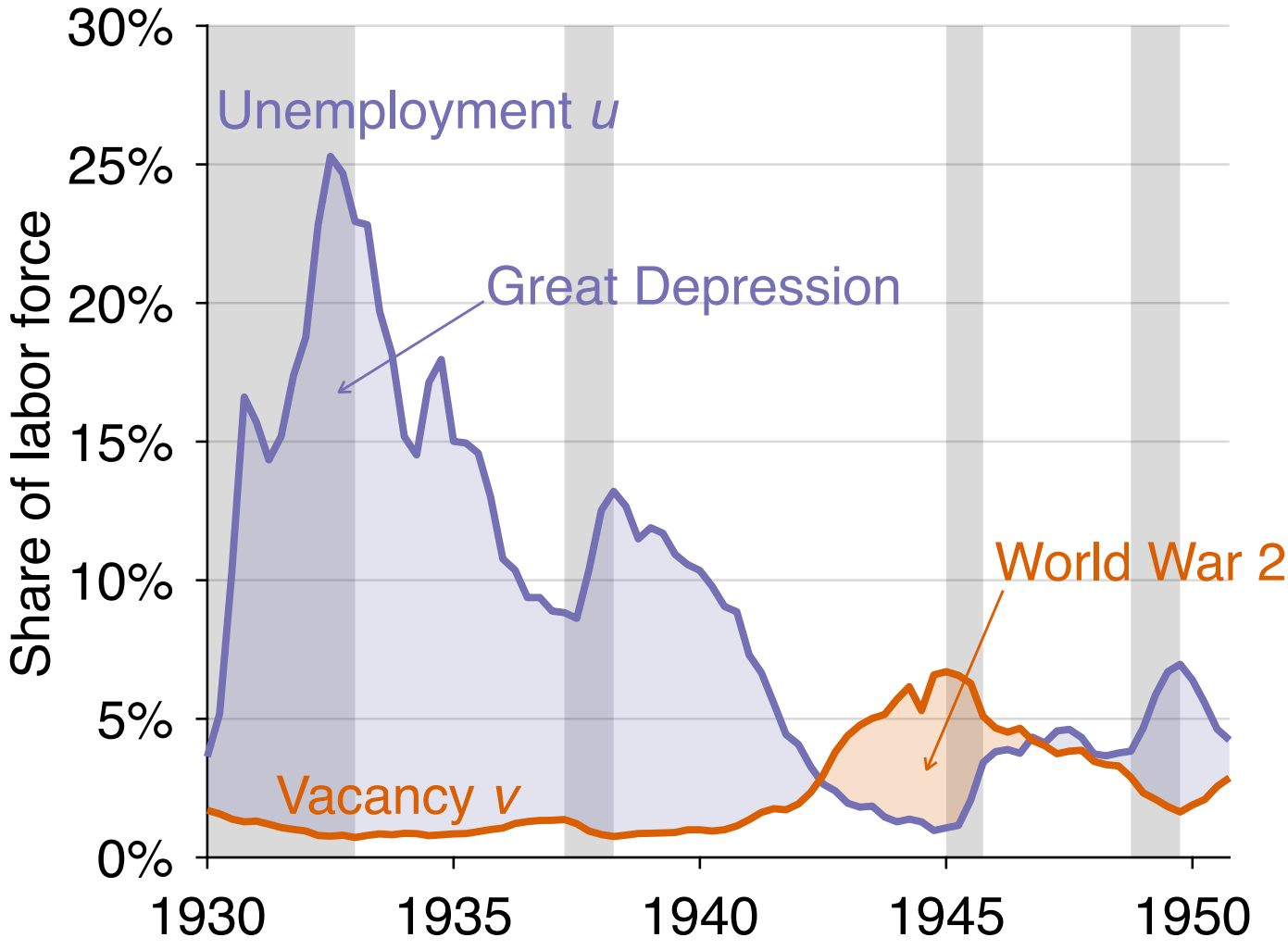
# BEVERIDGE CURVE ≈ HYPERBOLA



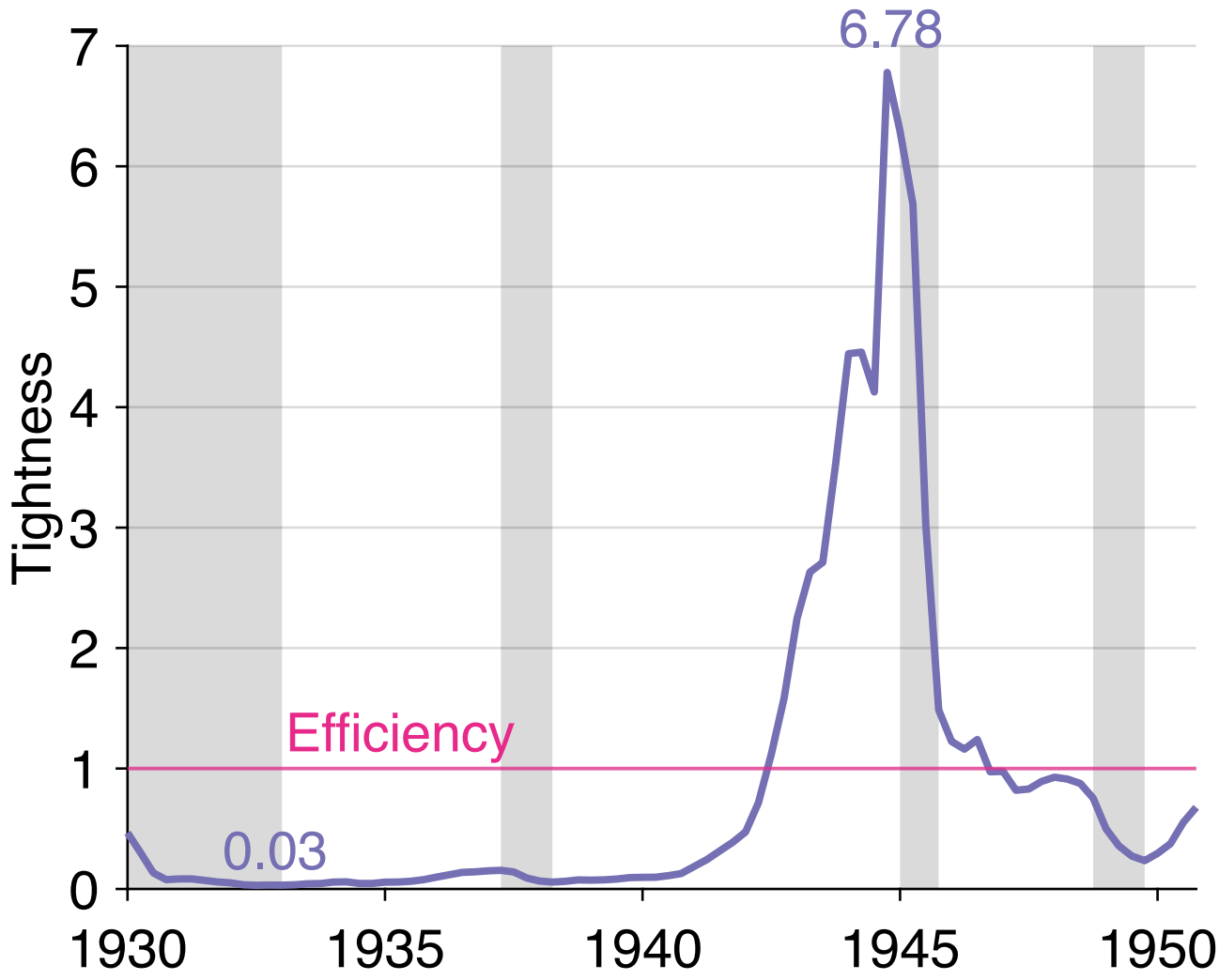
# BEVERIDGE CURVE ≈ HYPERBOLA

# PARALLEL: GREAT DEPRESSION AND PANDEMIC

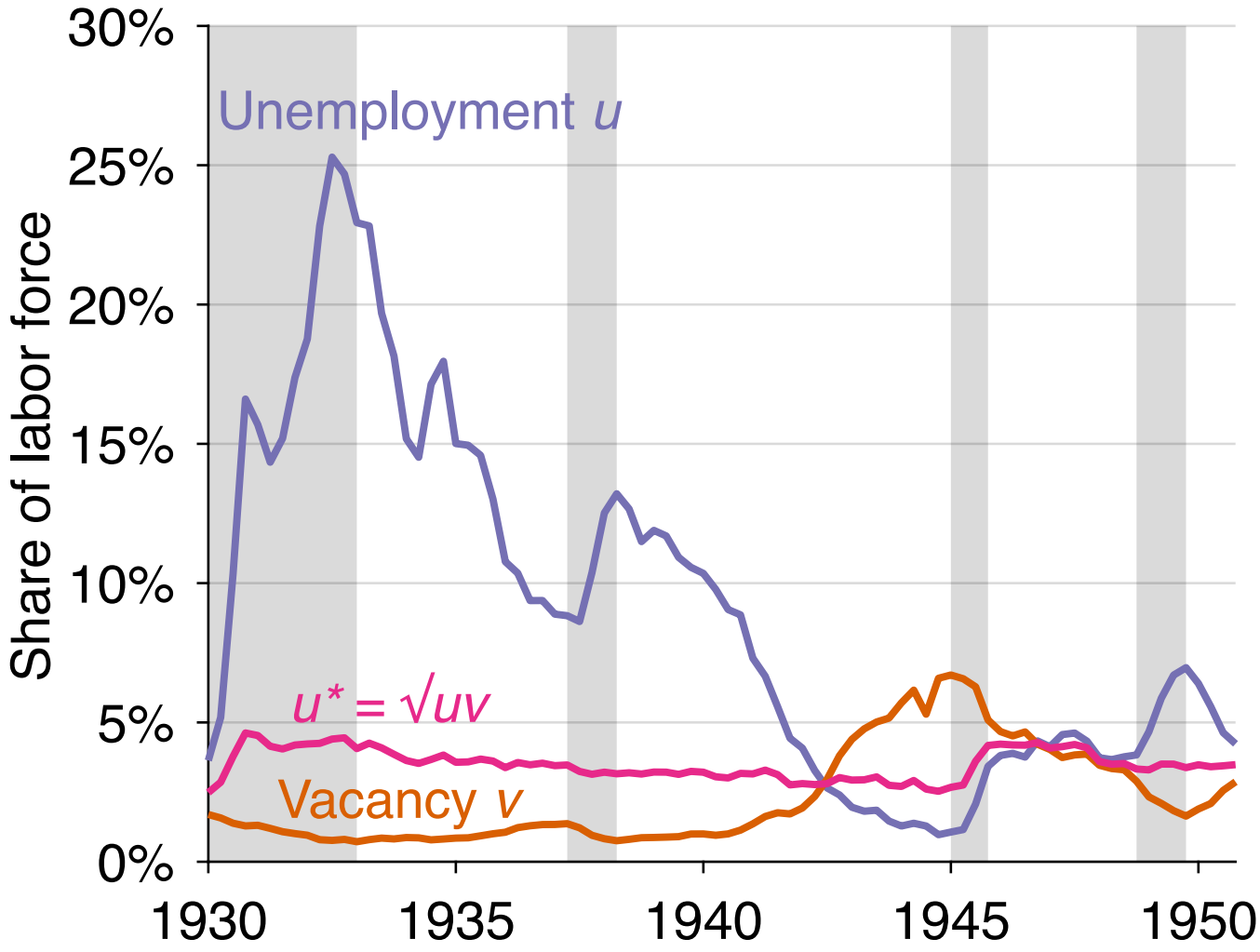
# ECONOMY WAS TOO SLACK UNTIL WW2



# LOWEST AND HIGHEST TIGHTNESS ON RECORD



# $u^*$ REMAINS IN 2.5%–4.6%, AVERAGES 3.5%



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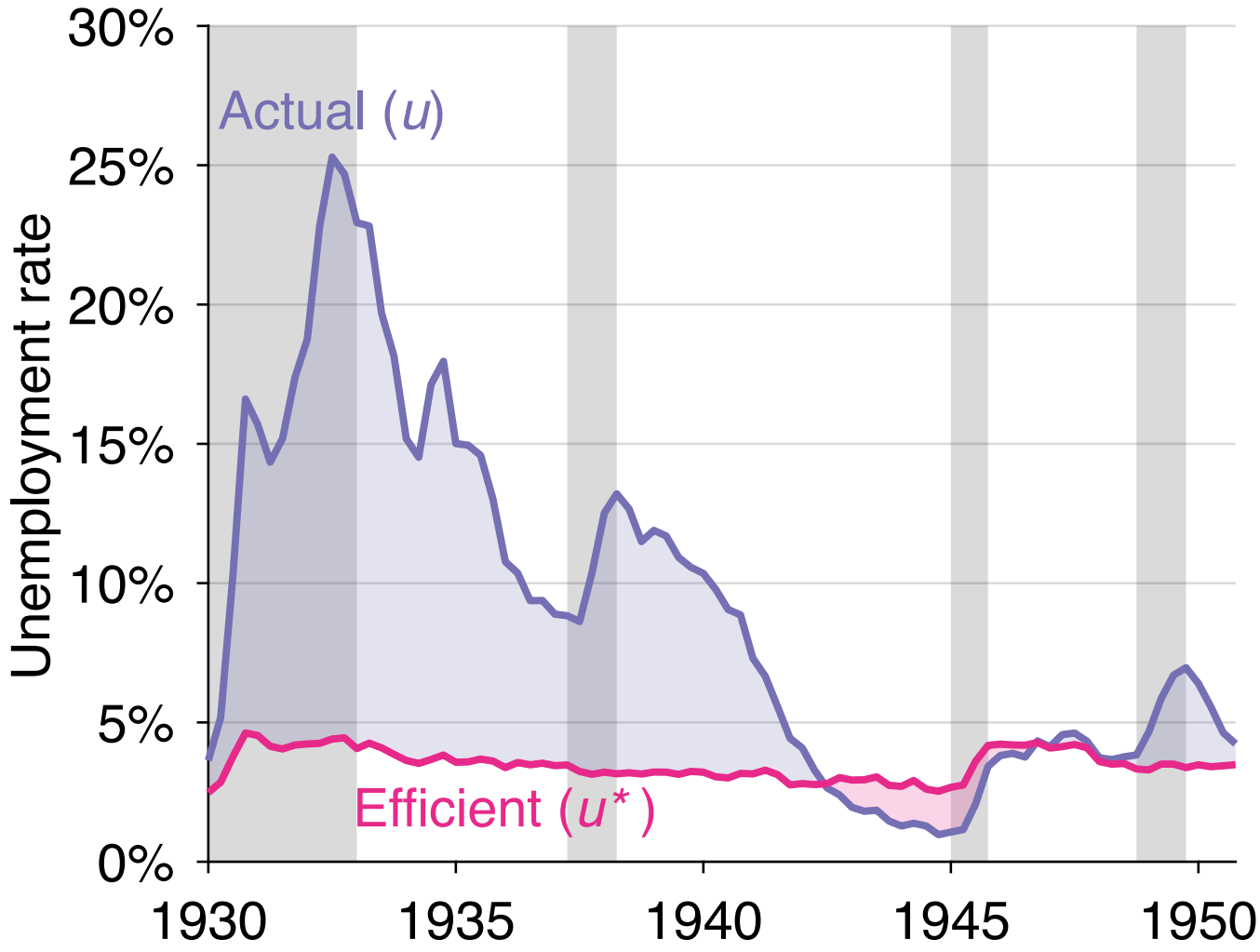
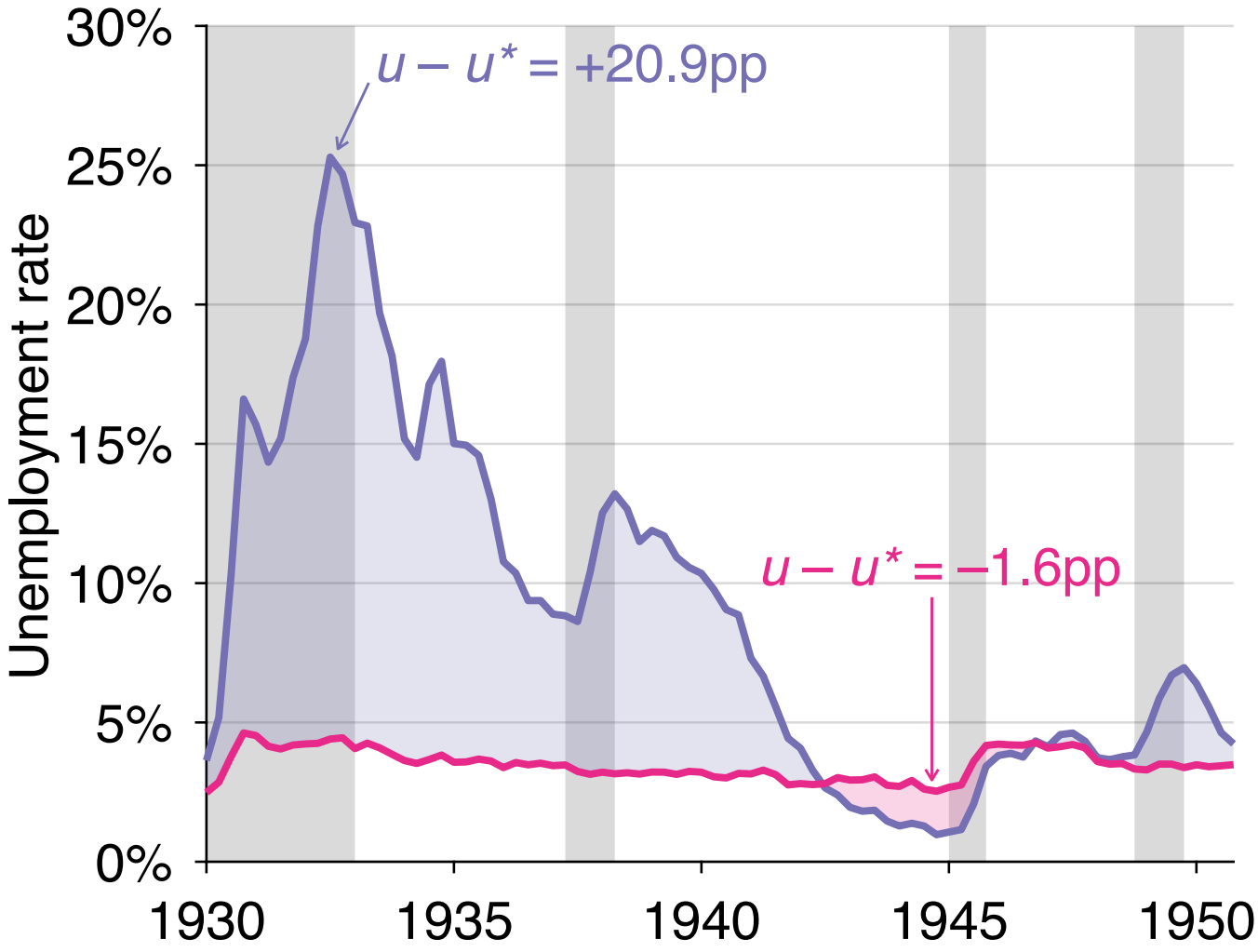
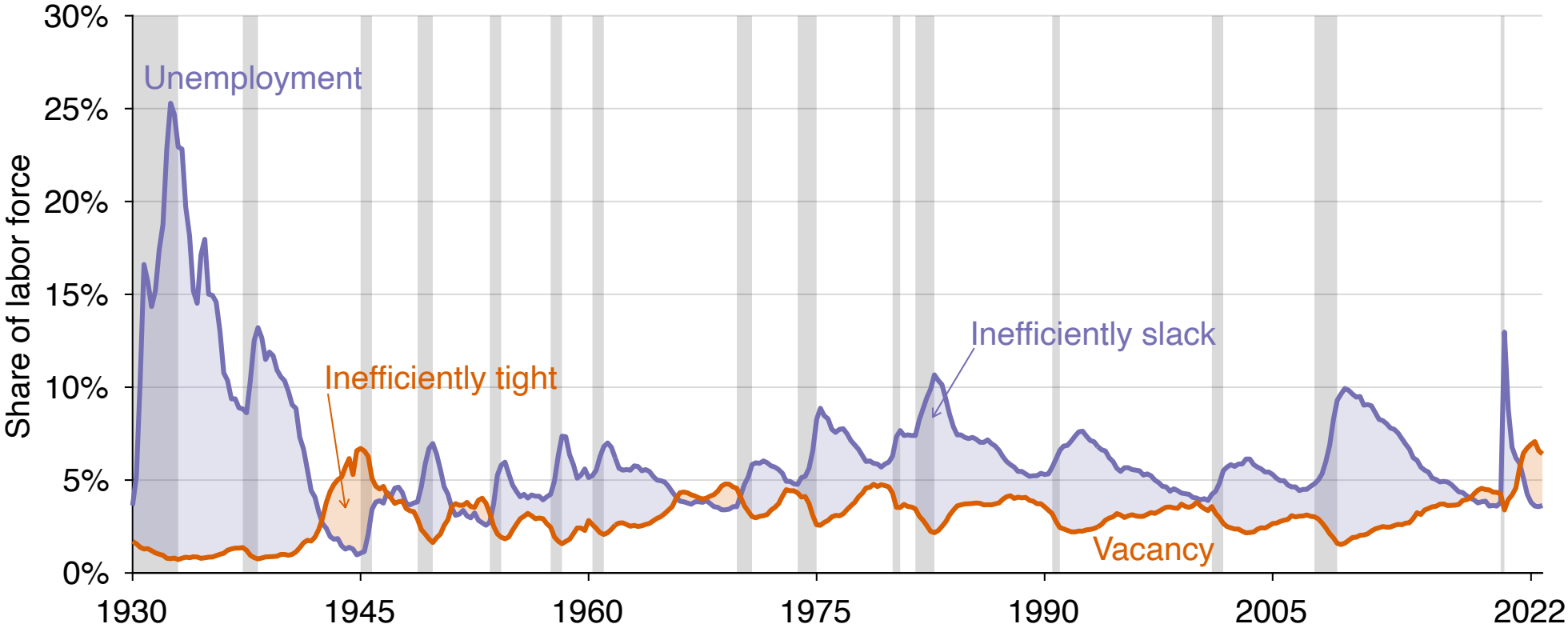


# MOST EXTREME UNEMPLOYMENT GAPS ON RECORD

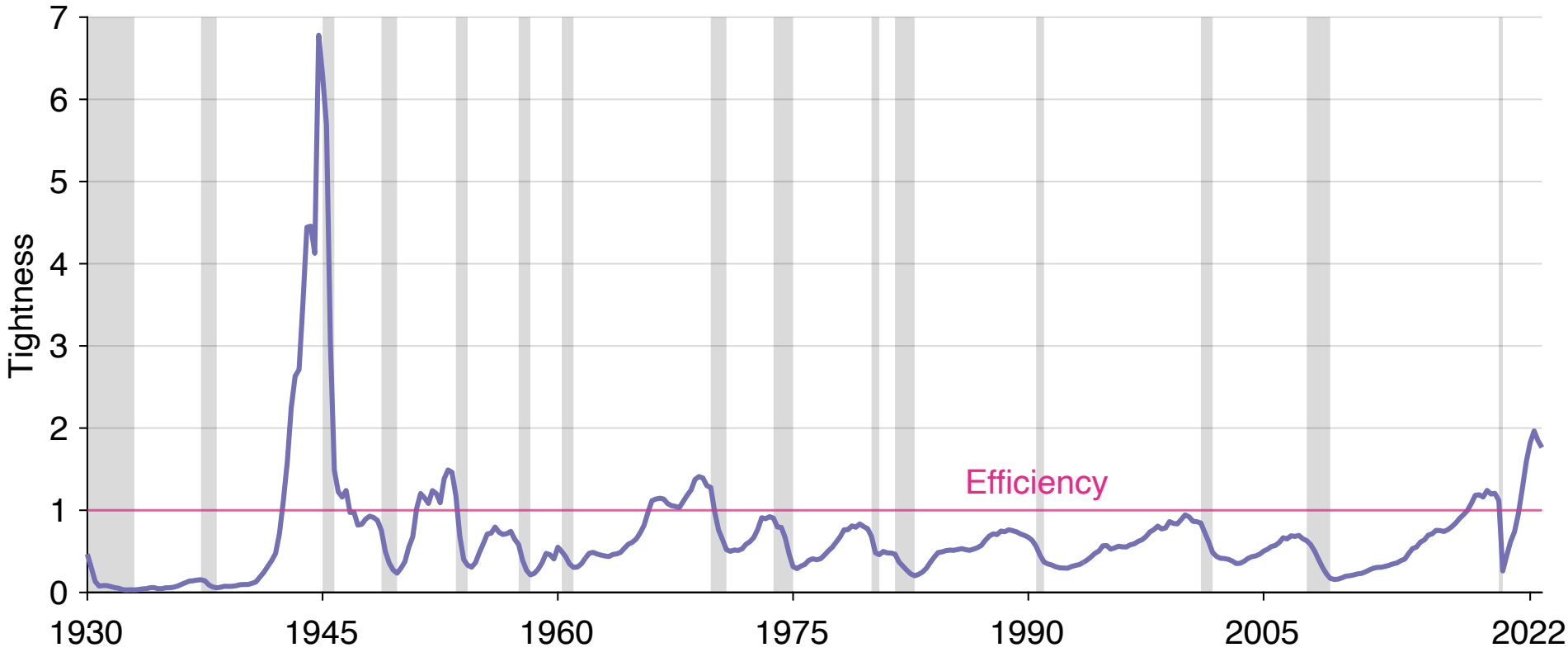


# SUMMARY

# EFFICIENCY CRITERION FOR US LABOR MARKET



# AN EQUIVALENT EFFICIENCY CRITERION



# $u^* = \sqrt{uv}$ AVERAGES 4.1% OVER 1930–2022