BEVERIDGEAN UNEMPLOYMENT GAP

Pascal Michaillat, Emmanuel Saez

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Paper available at https://www.pascalmichaillat.org/9.html

DOES THE LABOR MARKET OPERATE EFFICIENTLY?

- we develop welfare-based measure of unemployment gap
  - = actual unemployment rate – efficient unemployment rate

⇝ model design

- bargained wages?
- competitive search?
- rigid wages?

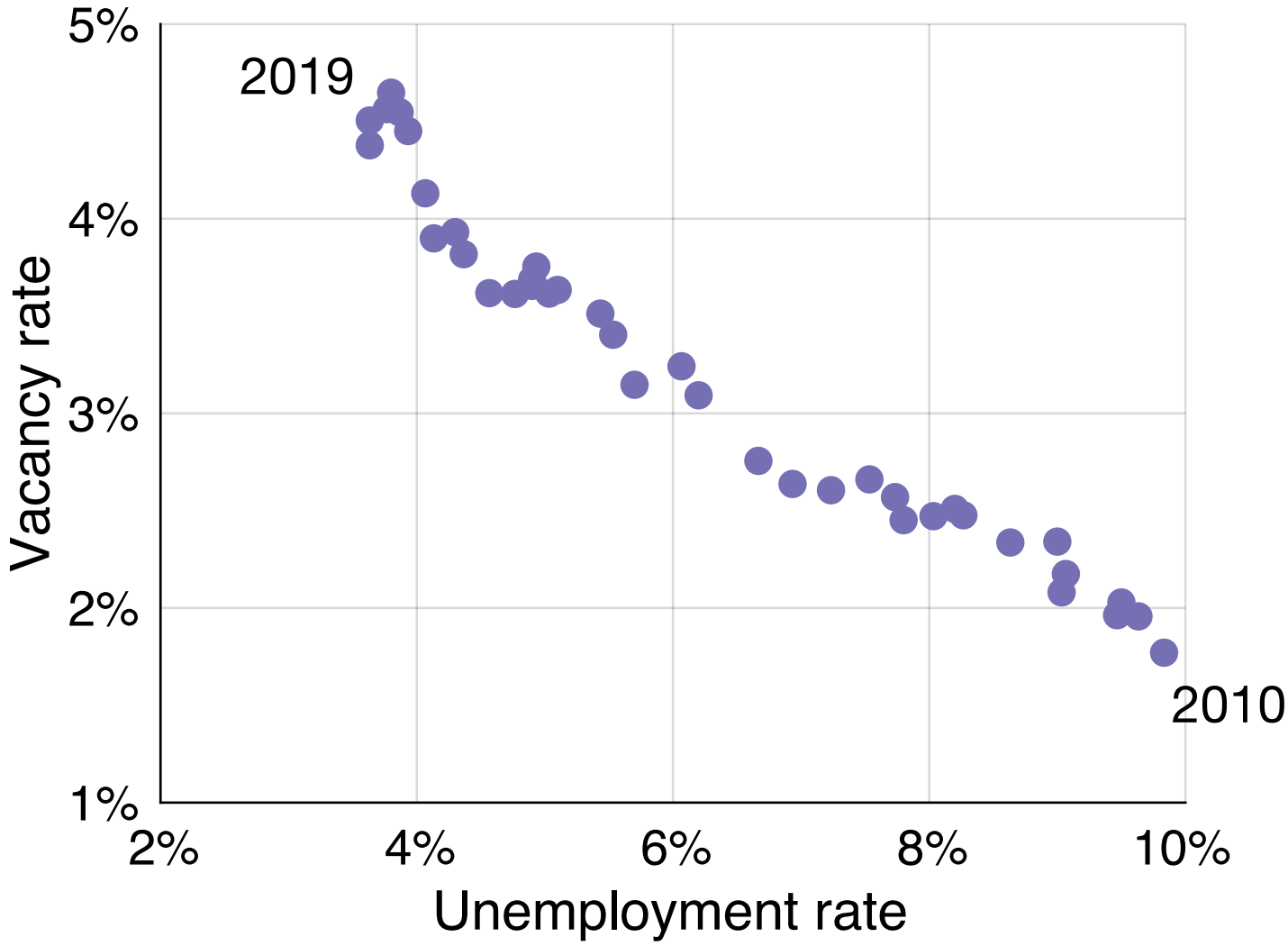
⇝ distance from “full employment”

⇝ optimal macro policies

- monetary policy
- fiscal policy
- unemployment insurance

THEORY

US BEVERIDGE CURVE



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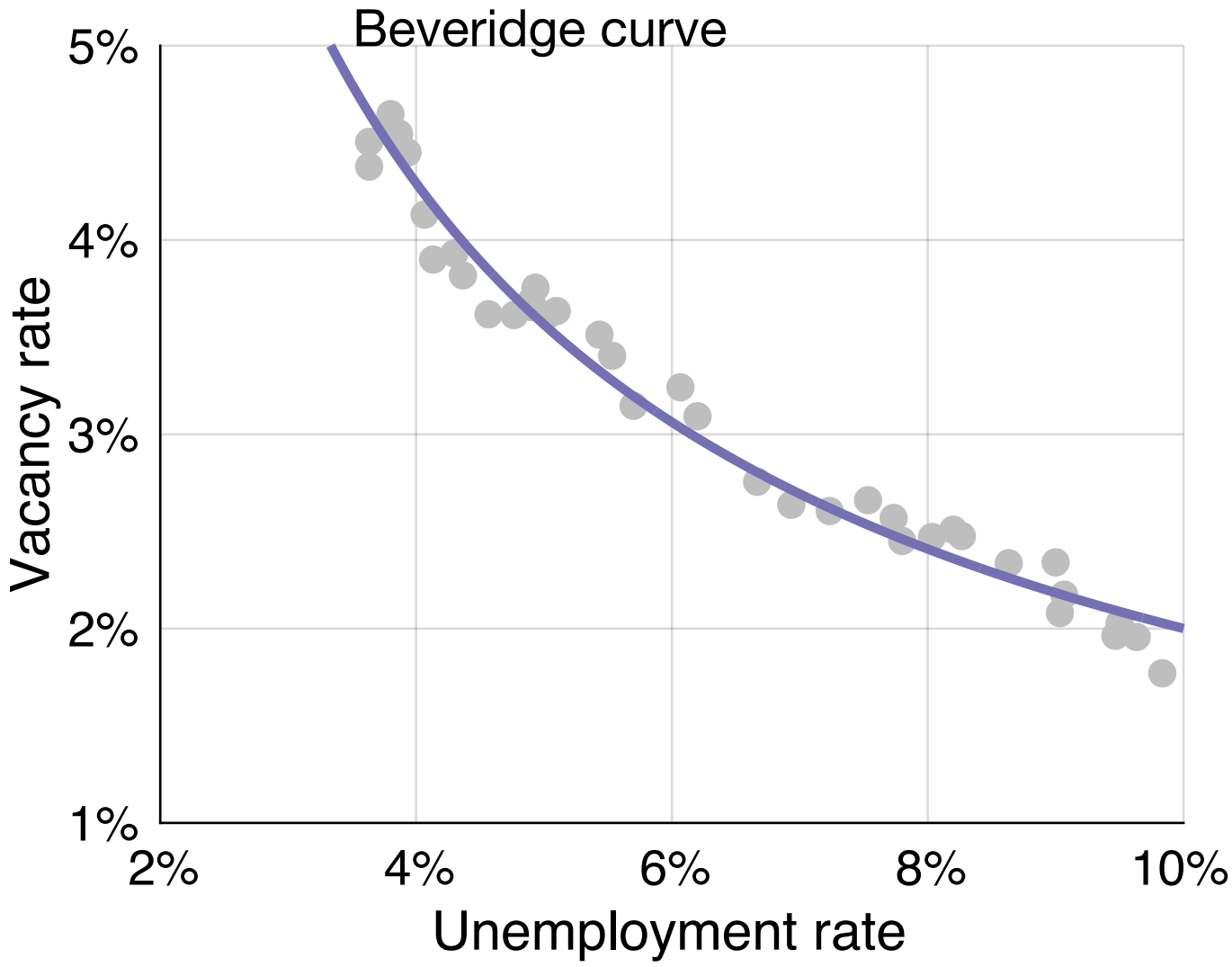
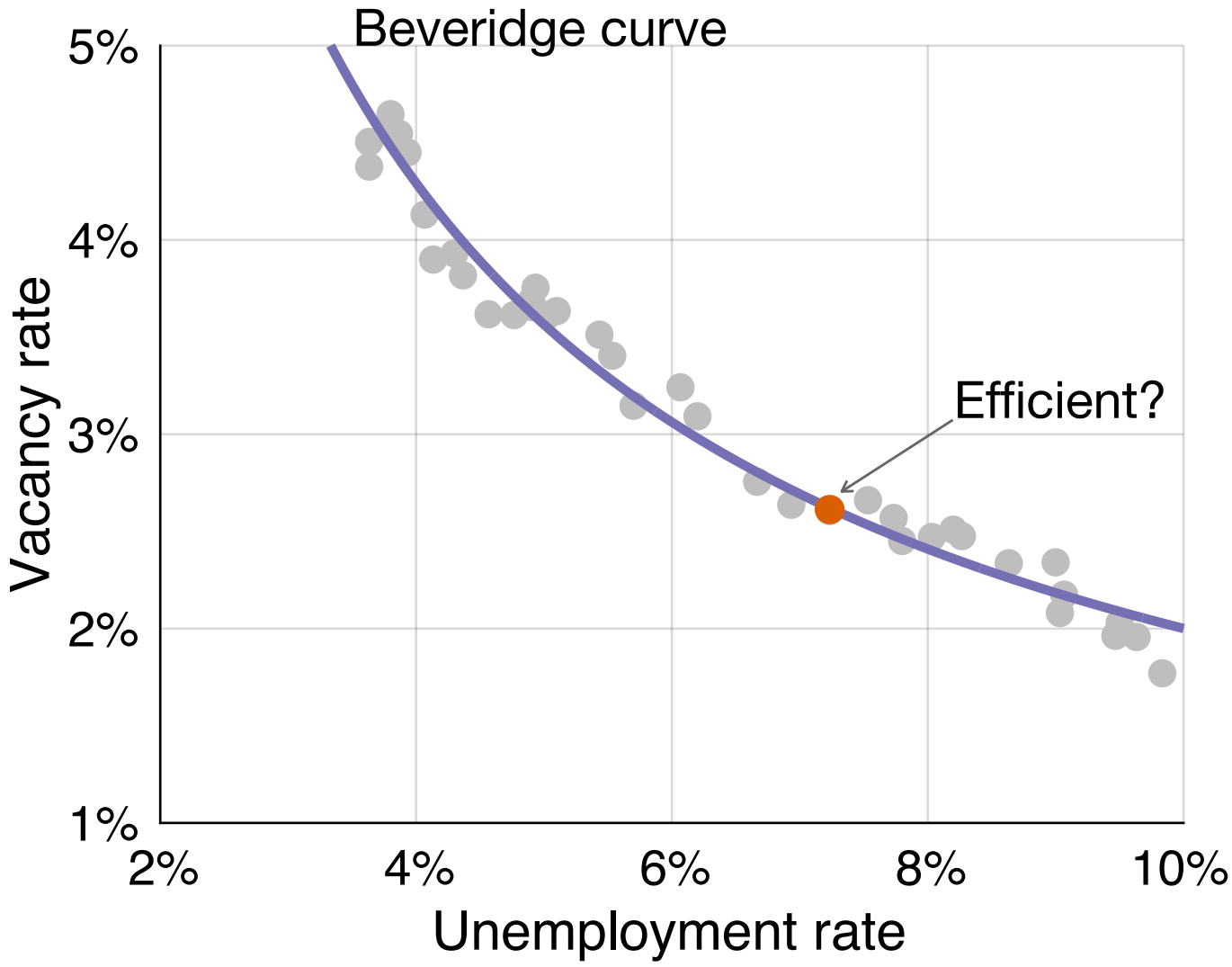


CONDITION FOR LABOR-MARKET EFFICIENCY



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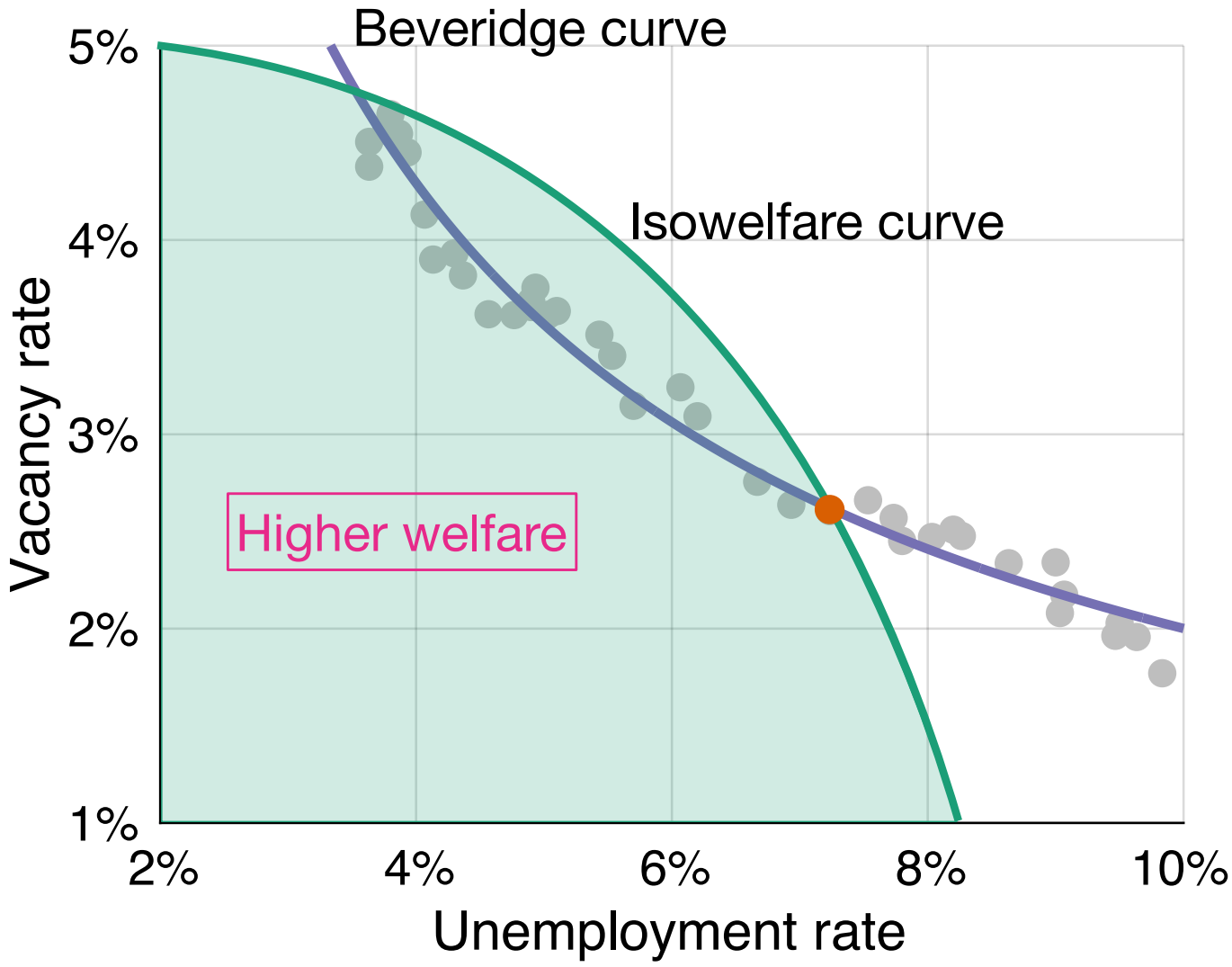

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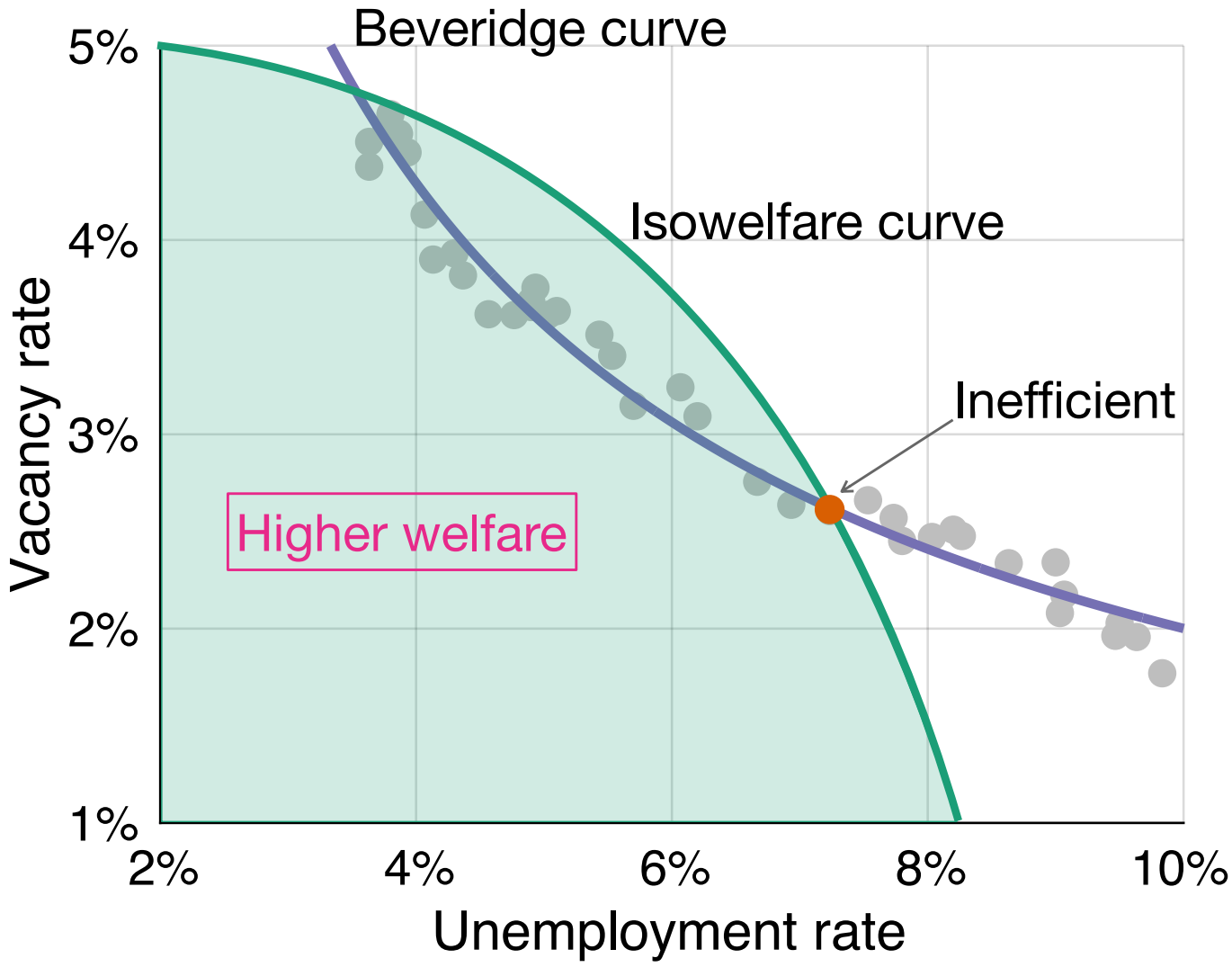

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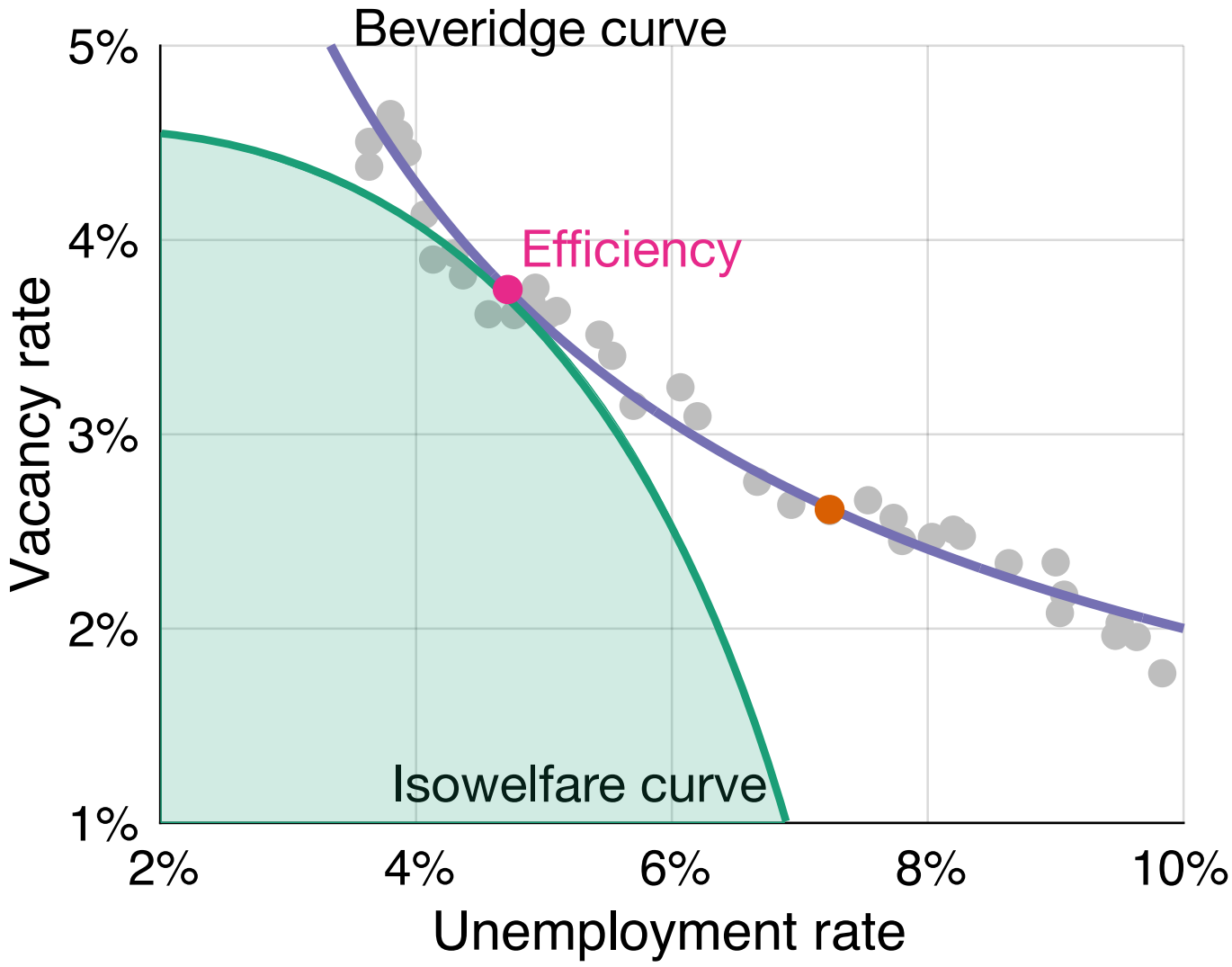

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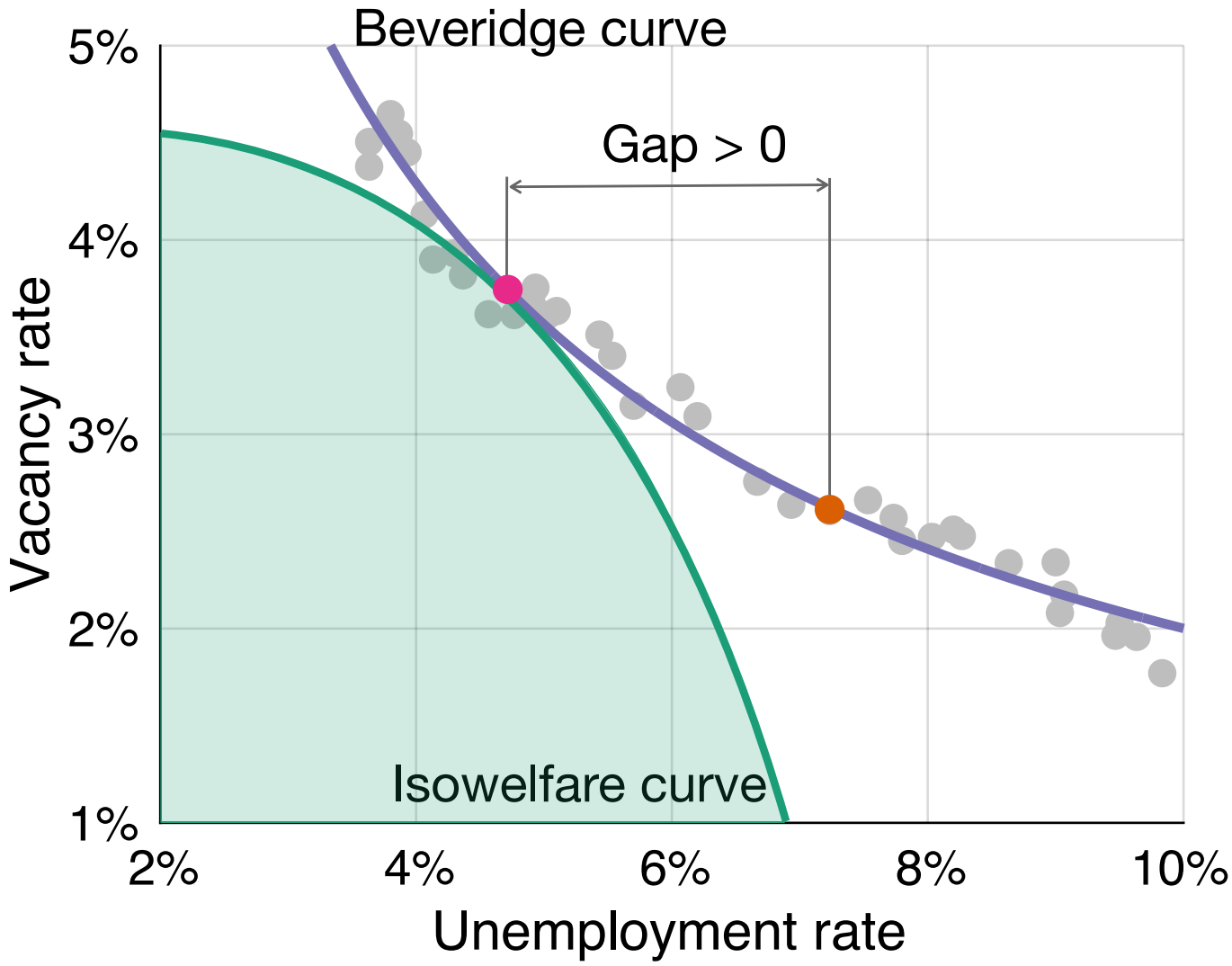

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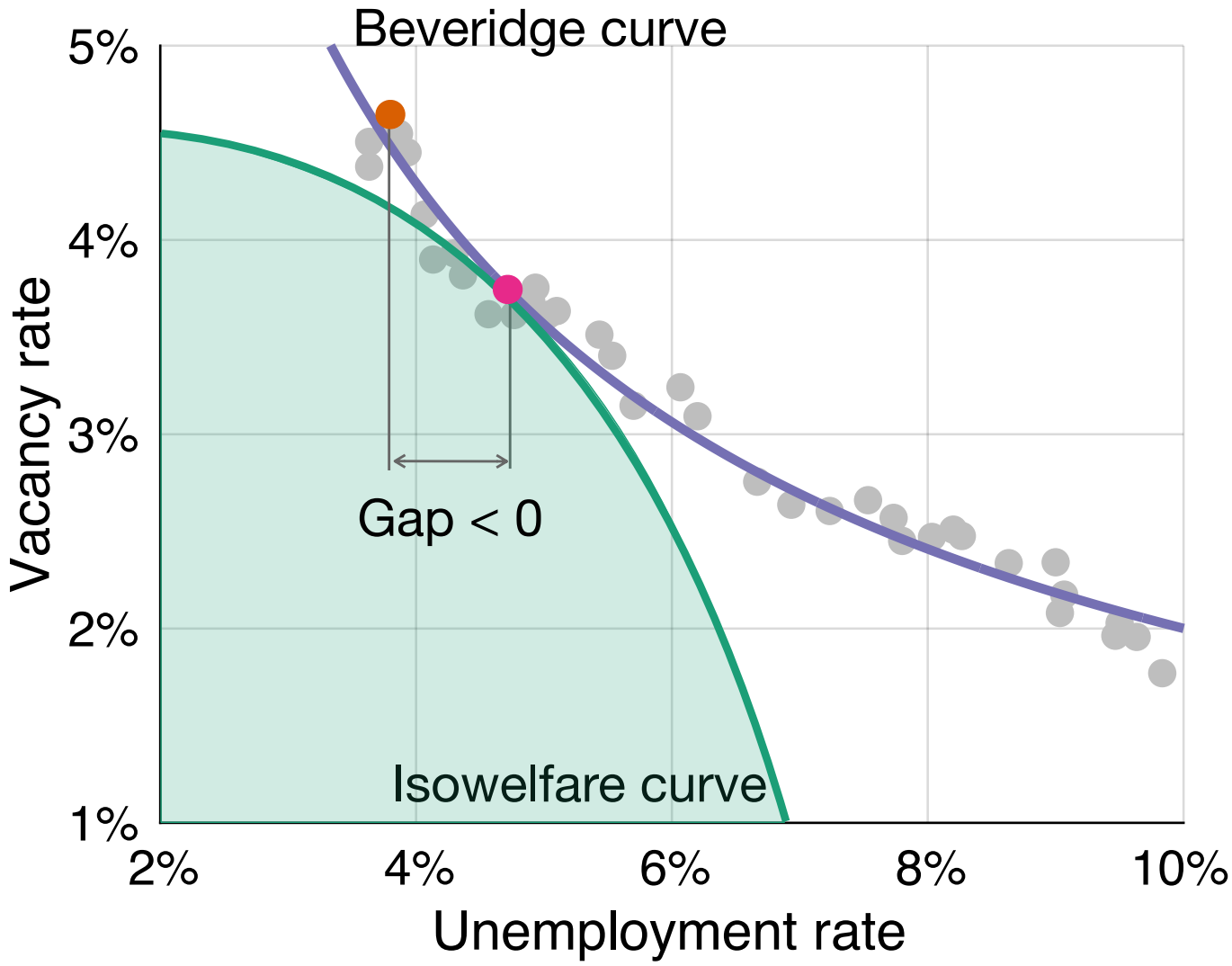

BEVERIDGEAN MODEL OF LABOR MARKET

1. Beveridge curve: $v(u)$
   - v: vacancy rate
   - u: unemployment rate
   - $v(u)$: decreasing in u, convex
2. social welfare: $\widehat{\mathcal{W}}(u, v) = \mathcal{W}(n, u, v)$ with $n = 1 - u$
   - n: employment rate
   - $\mathcal{W}$: production + recruiting + preferences
   - $\widehat{\mathcal{W}}(u, v)$: decreasing in u and v, quasiconcave

GRAPHICAL CONDITION FOR EFFICIENCY

- efficiency at tangency point: $v'(u) = MRS_{uv}$
- decomposing the social marginal rate of substitution:

$$MRS_{uv} = -\frac{\partial \widehat{\mathcal{W}}/\partial u}{\partial \widehat{\mathcal{W}}/\partial v}$$

- social value of nonwork: $\zeta = (\partial \mathcal{W}/\partial u)/(\partial \mathcal{W}/\partial n) < 1$
- recruiting cost: $\kappa = -(\partial \mathcal{W}/\partial v)/(\partial \mathcal{W}/\partial n) > 0$
- efficiency condition:

$$v'(u) = -\frac{1-\zeta}{\kappa}$$

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SUFFICIENT-STATISTIC FORMULA FOR EFFICIENCY

- labor market tightness: $\theta = v/u$
- Beveridge elasticity: $\epsilon = -d\ln(v)/d\ln(u) > 0$
- efficient labor market tightness:

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- u^* obtained from θ^* through Beveridge curve

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$$\frac{u^*}{u} = \left(\frac{\theta^*}{\theta}\right)^{-1/(1+\epsilon)}$$

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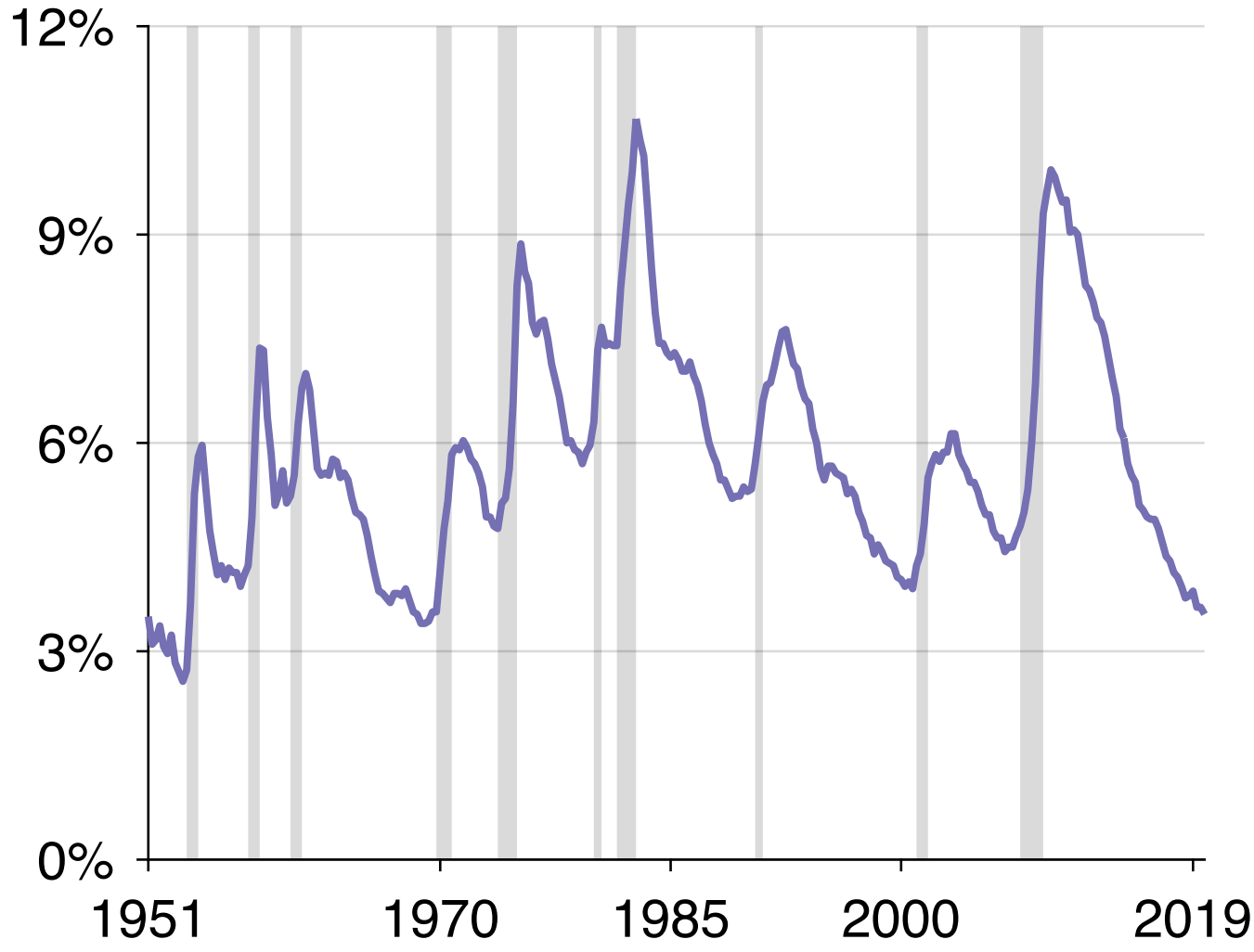
- u^* obtained from θ^* through Beveridge curve

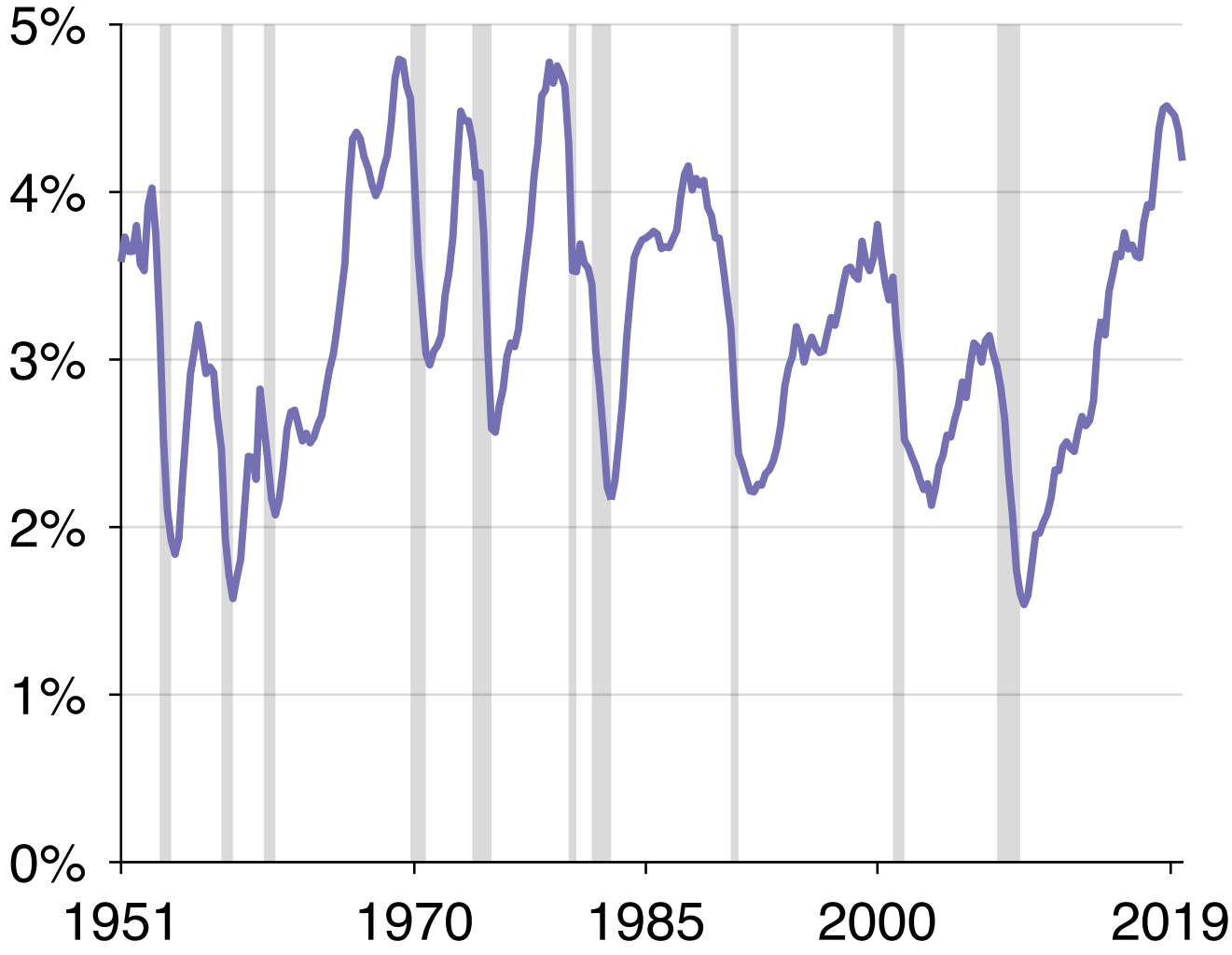
$$u^* = \left(\frac{\kappa \cdot \epsilon}{1-\zeta} \cdot \frac{v}{u^{-\epsilon}} \right)^{1/(1+\epsilon)}$$

APPLICATION TO THE UNITED STATES

UNEMPLOYMENT RATE (CPS)



VACANCY RATE (BARNICHON 2010 & JOLTS)



BEVERIDGE-CURVE BRANCHES (BAI, PERRON 1998)

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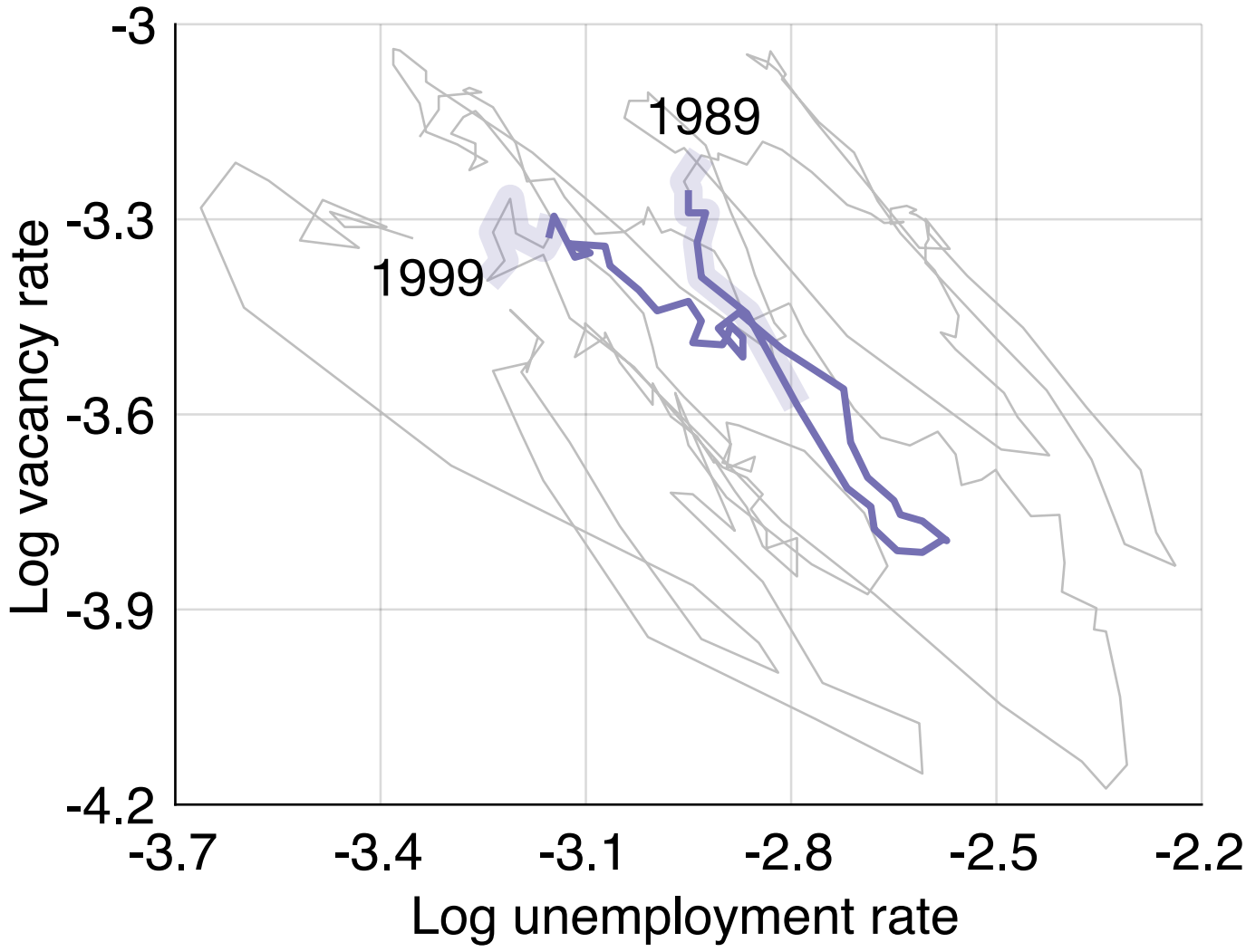

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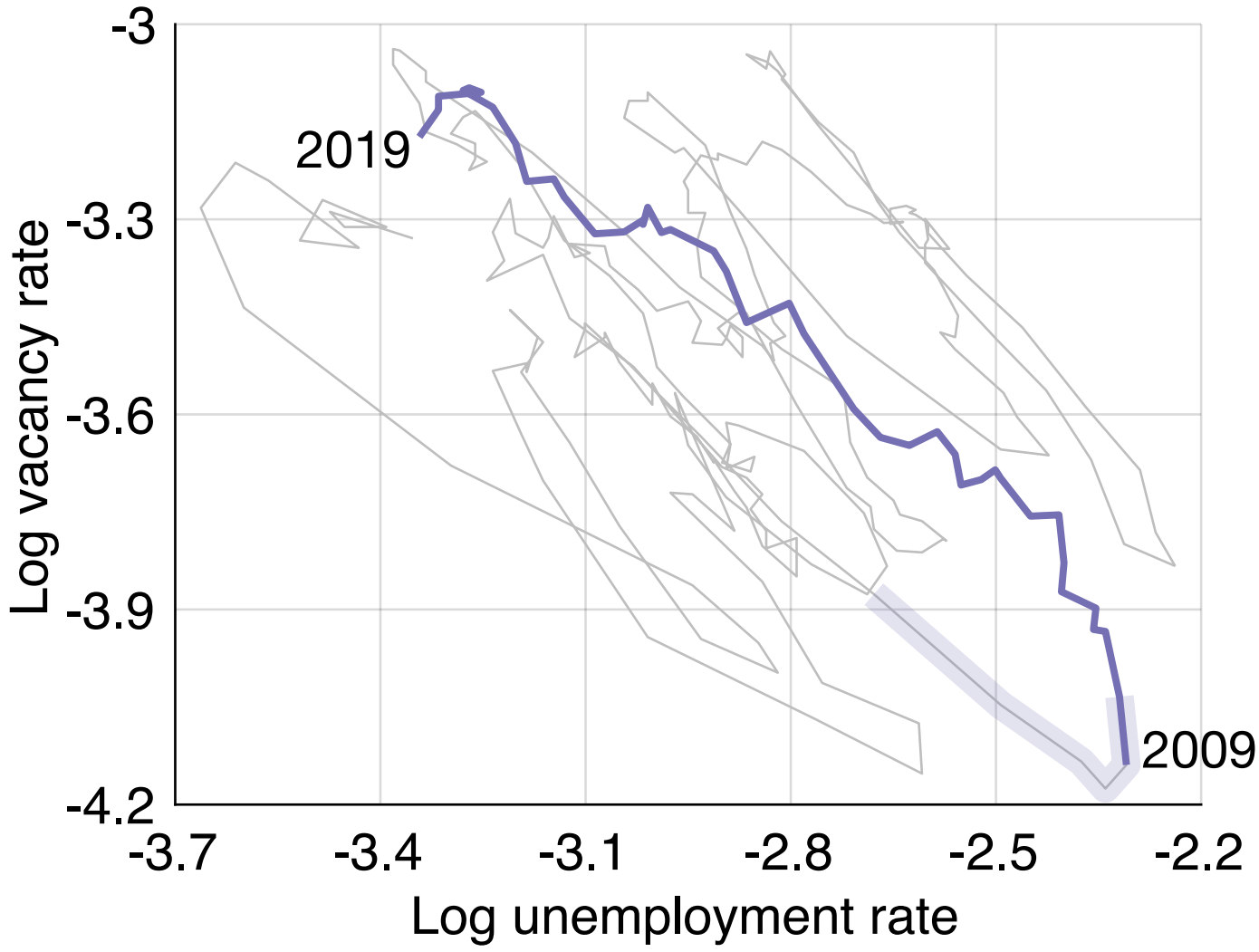
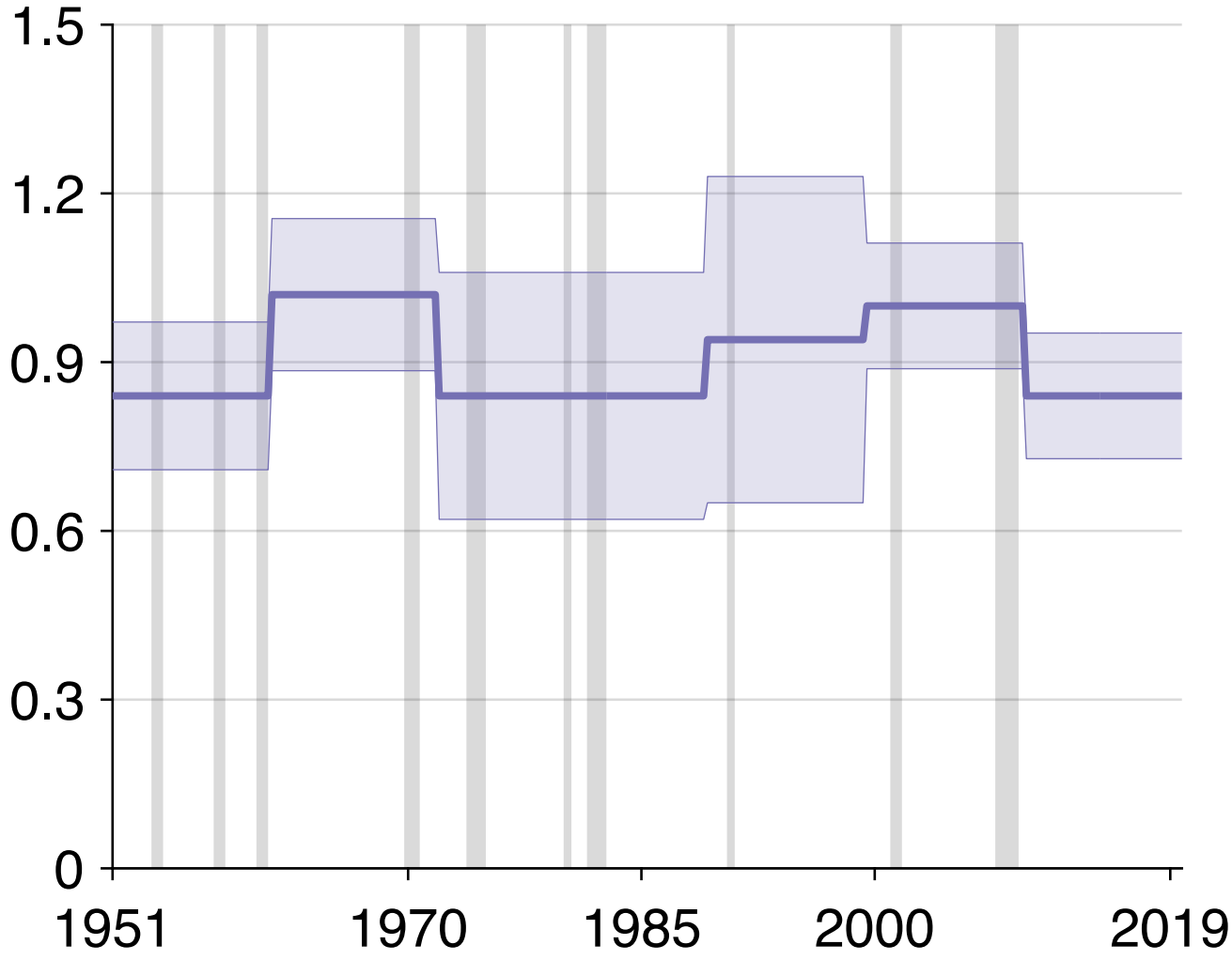


BEVERIDGE ELASTICITY (BAI, PERRON 1998)



SOCIAL VALUE OF NONWORK

- Borgschulte, Martorell (2018): natural experiment using military administrative data
  - 420,000 veterans
  - home production + recreation = 13%–35% earnings
- Mas, Pallais (2019): field experiment in which job applicants choose wage-hour bundles
  - 900 subjects
  - home production + recreation = 58% earnings

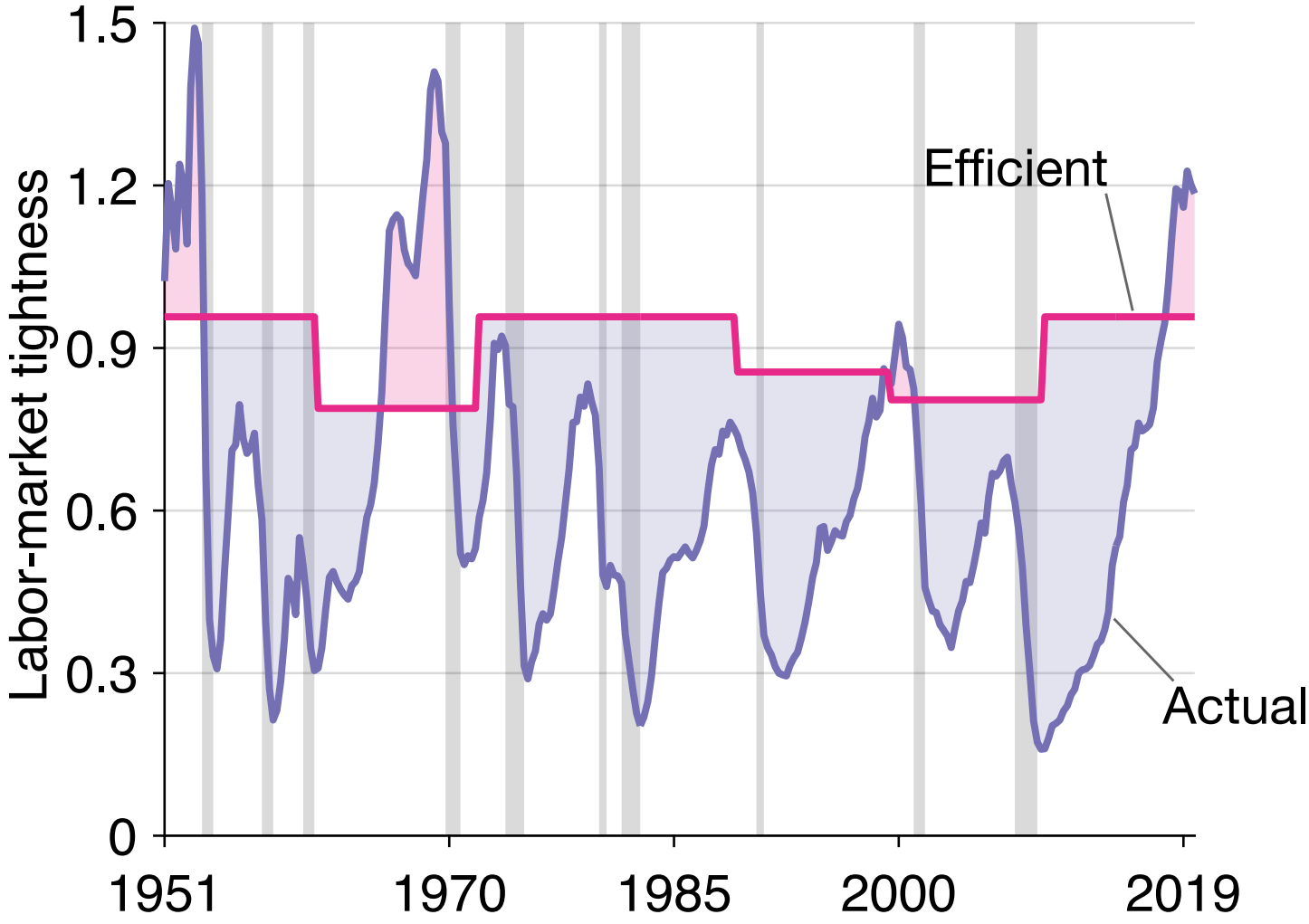
$\rightsquigarrow$ $\zeta \in [0.03, 0.49]$, with median value of $\zeta = 0.26$

RECRUITING COST

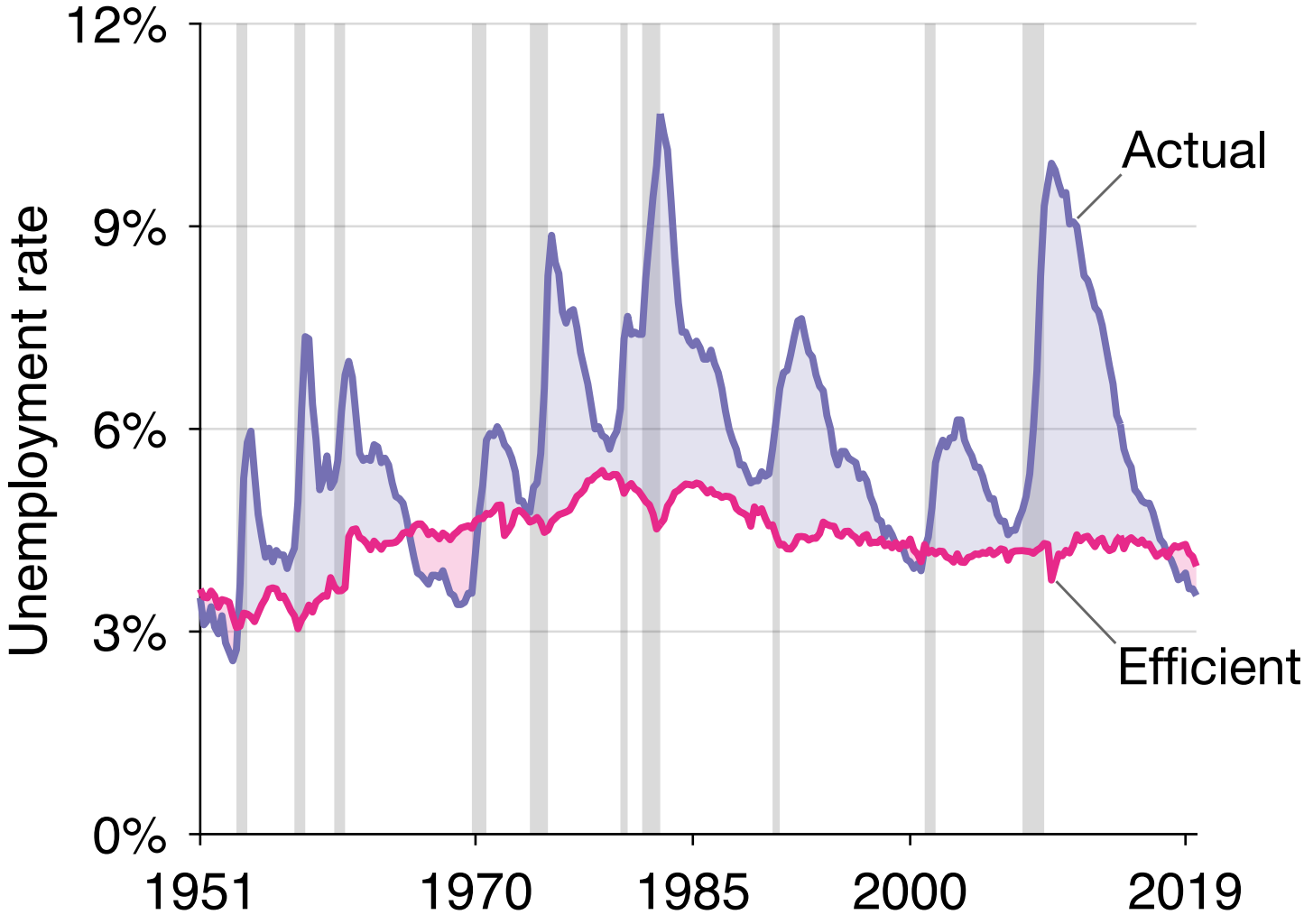
- 1997 National Employer Survey, administered by Census Bureau
  - 2,000 establishments
  - establishments have $\geq$ 20 workers
  - establishments belong to all industries
- recruiting = 3.2% of labor costs

$\rightsquigarrow$ $\kappa = 0.92$

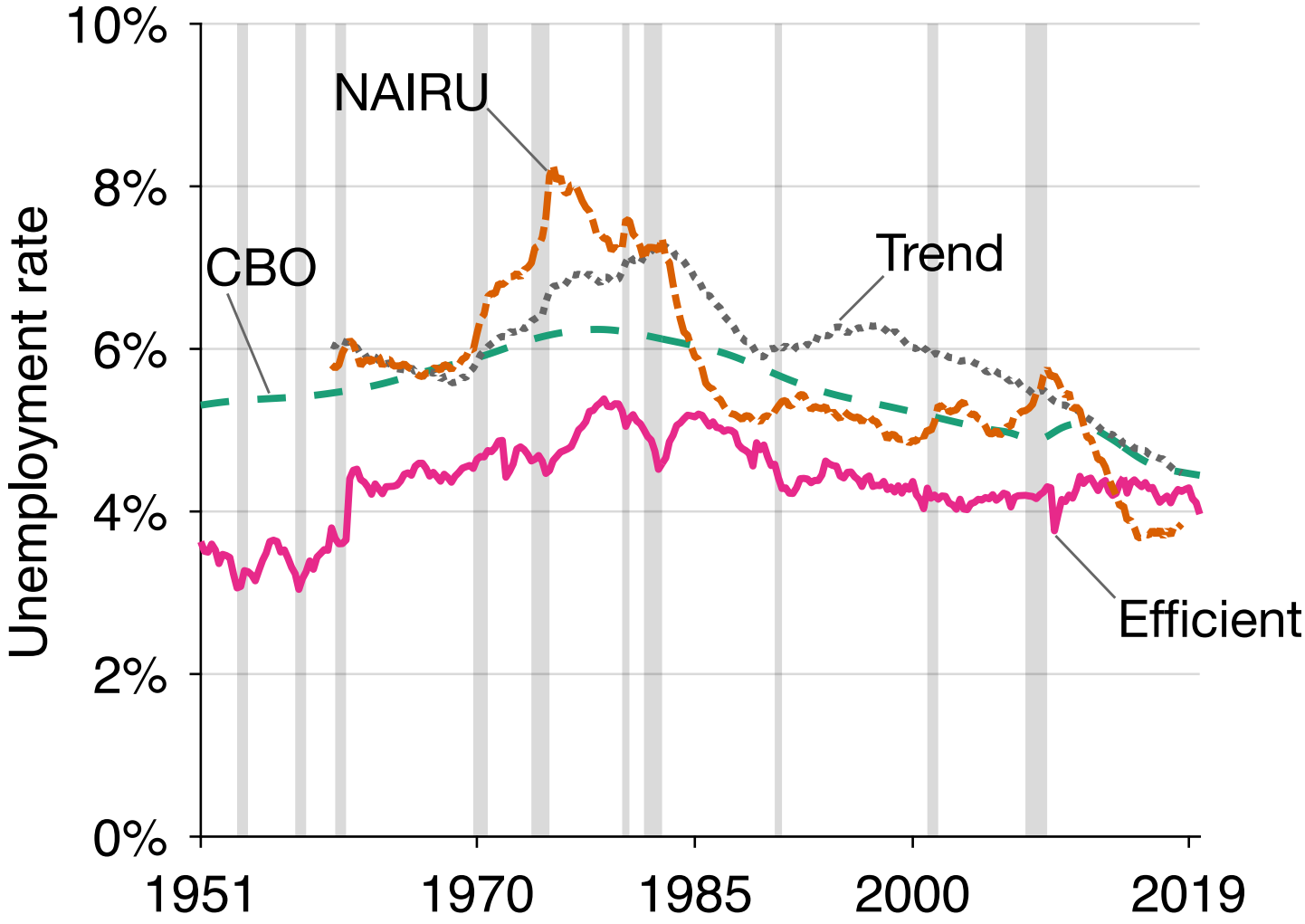
EFFICIENT TIGHTNESS & TIGHTNESS GAP



EFFICIENT UNEMPLOYMENT & UNEMPLOYMENT GAP

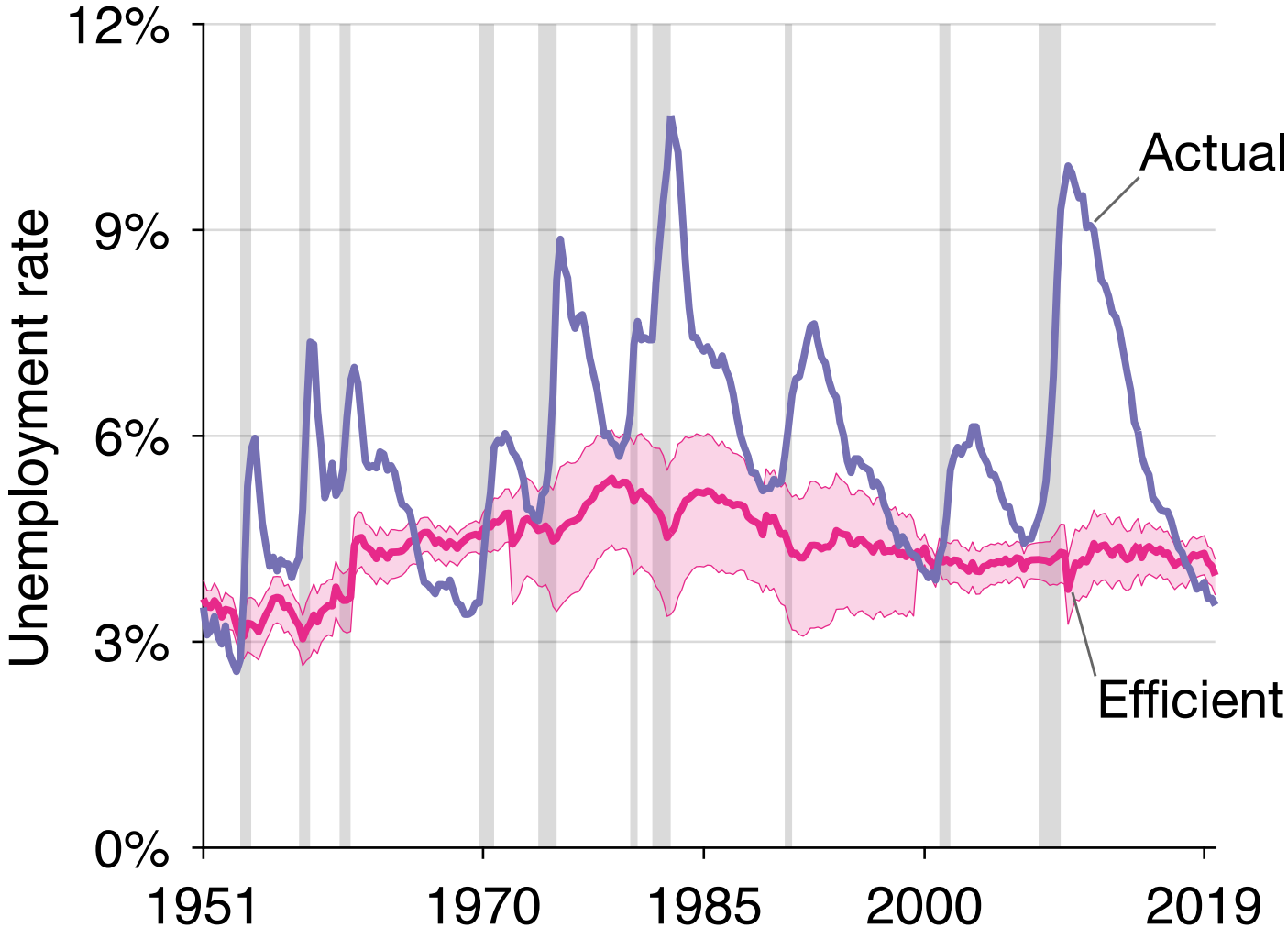


COMPARISON WITH EXISTING "NATURAL RATES"

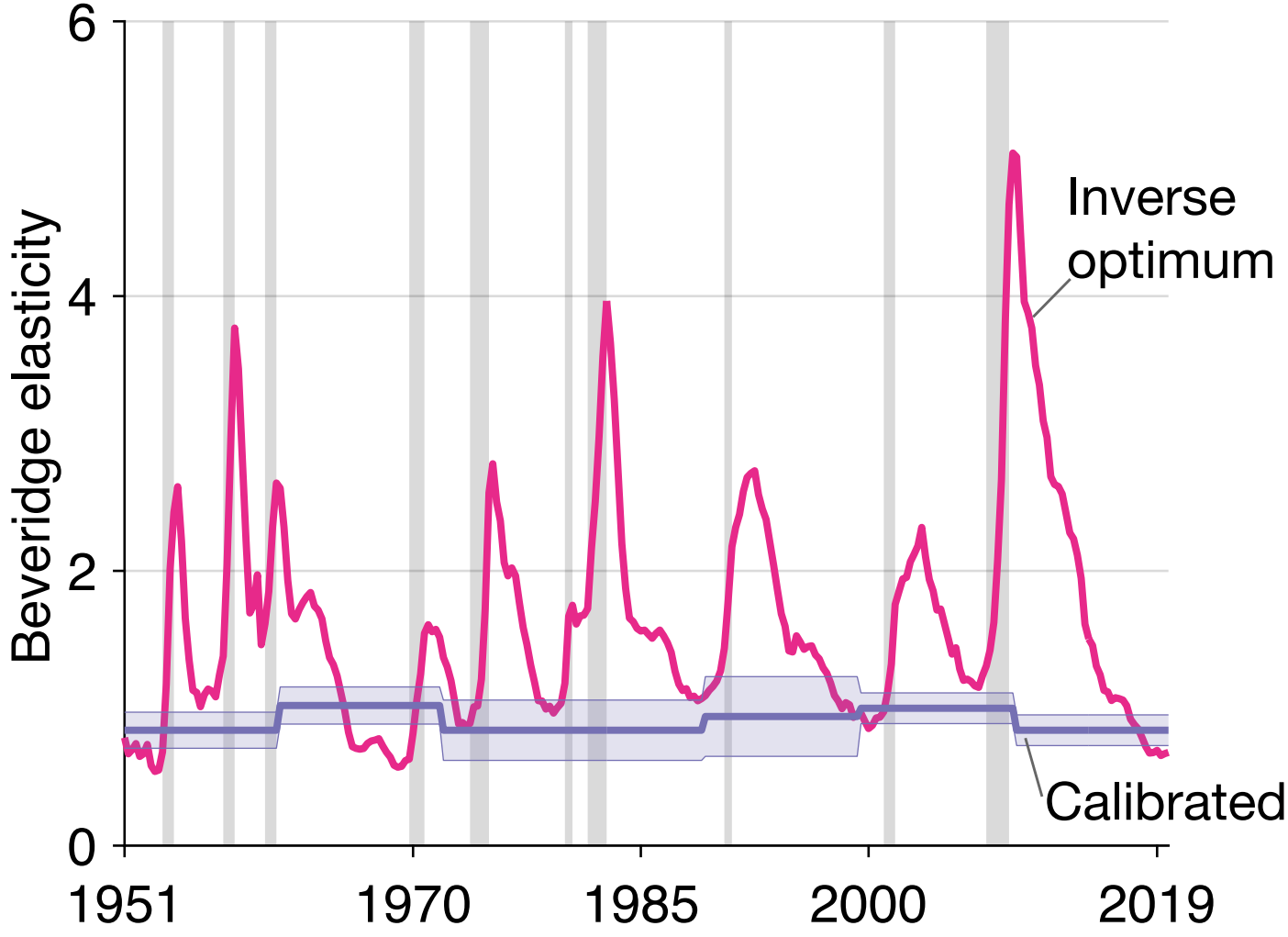


ALTERNATIVE CALIBRATIONS OF STATISTICS

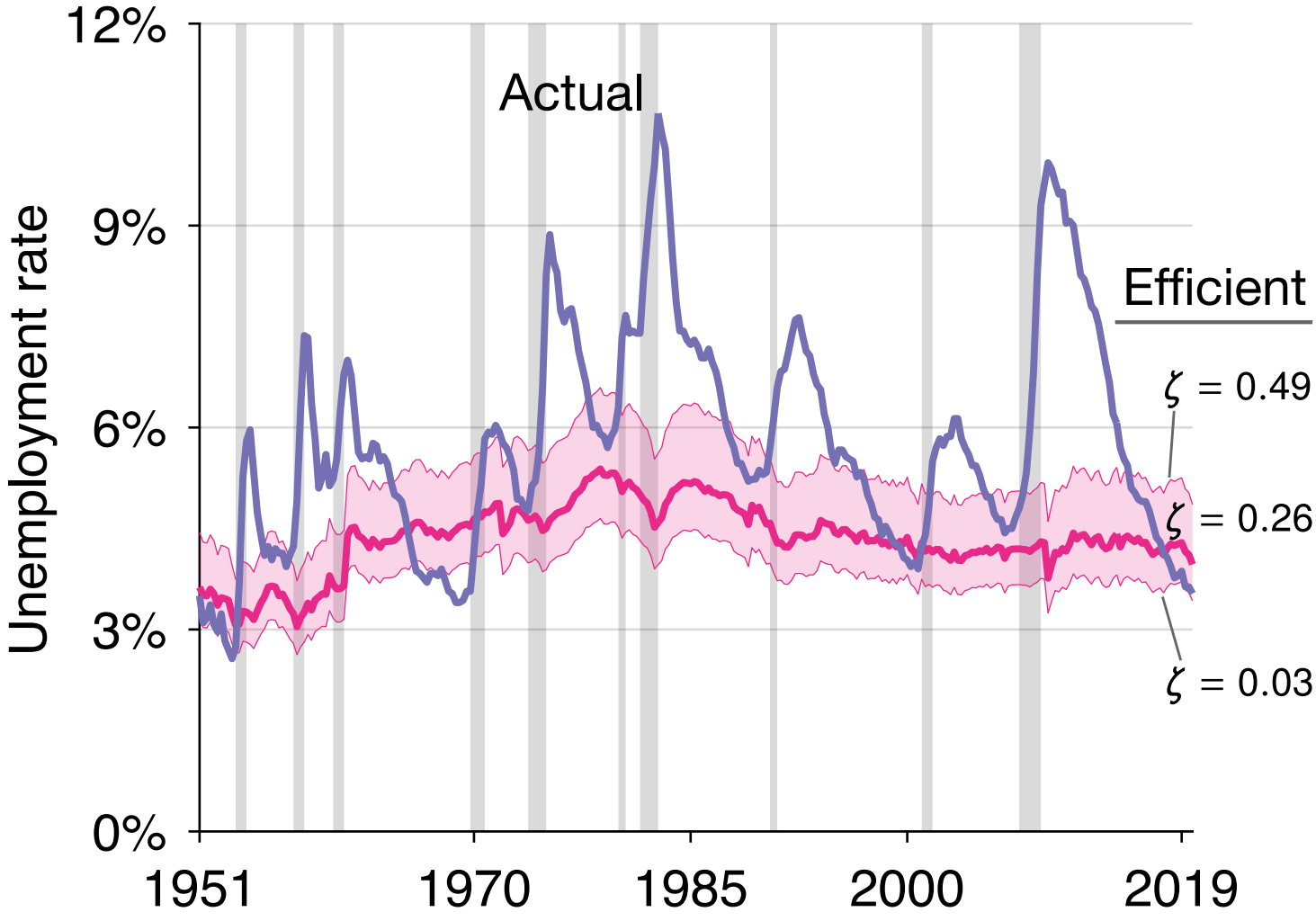
BEVERIDGE ELASTICITY IN 95% CI



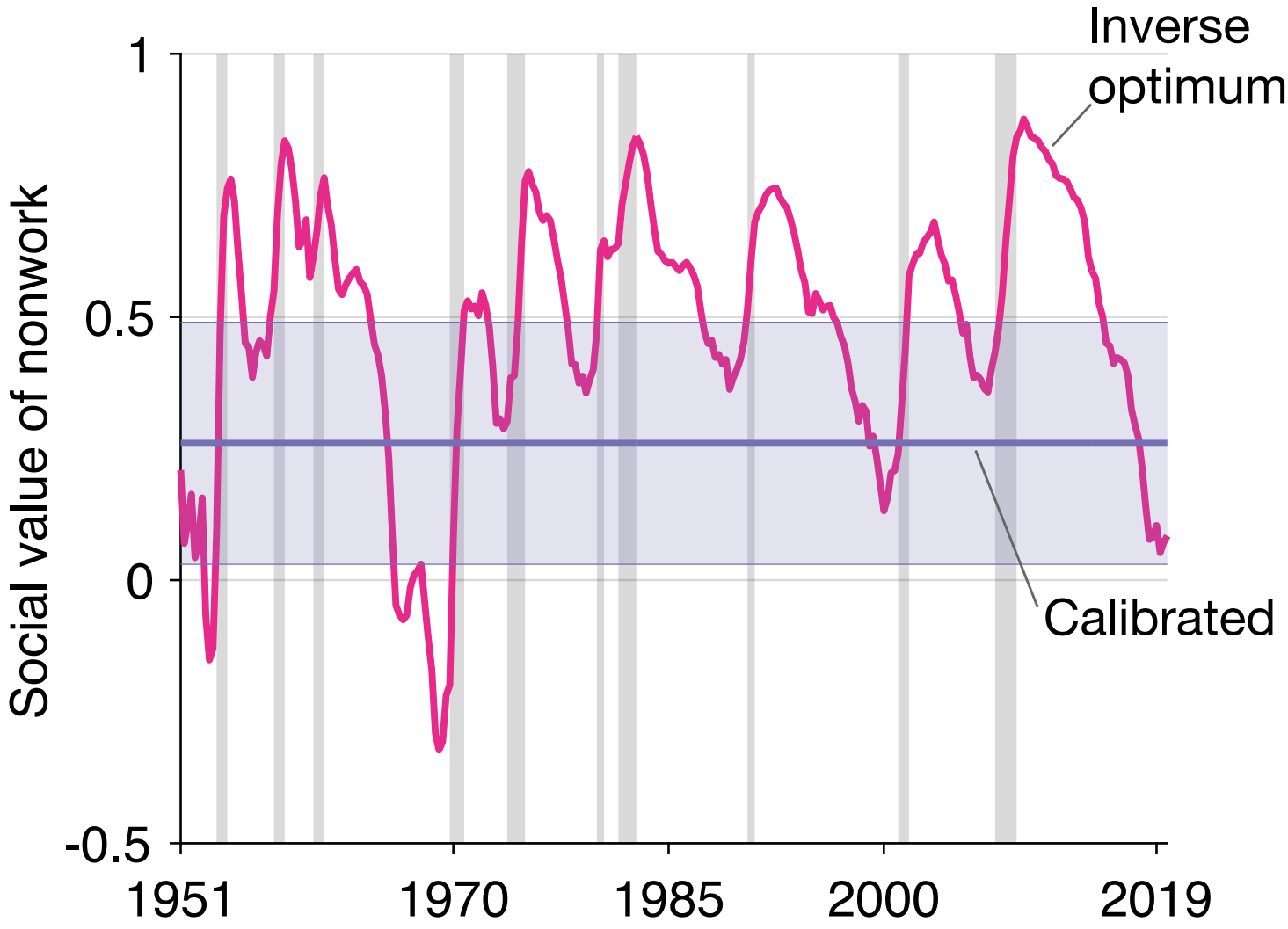
INVERSE-OPTIMUM ϵ, SO $u = u^*$



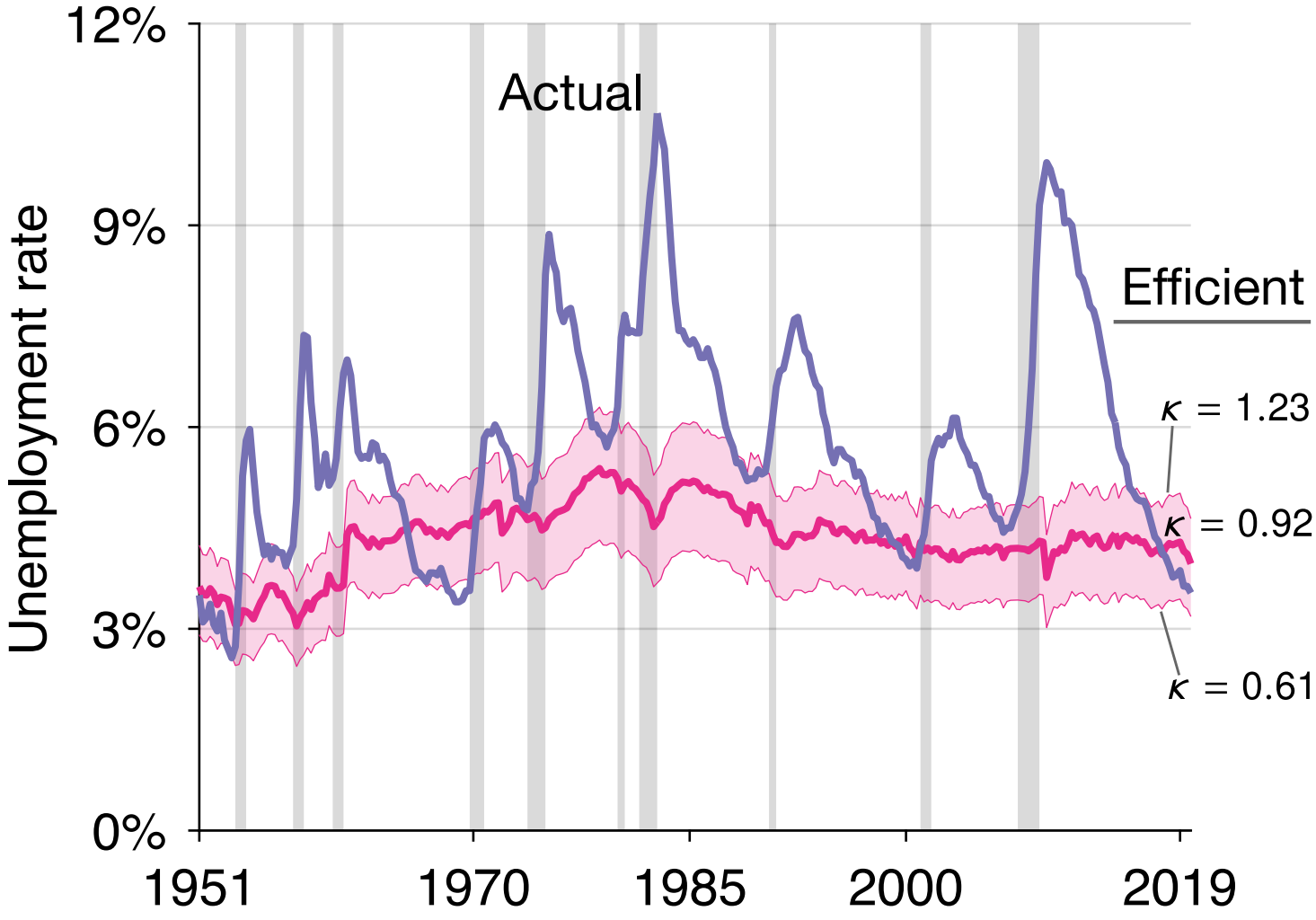
PLAUSIBLE SOCIAL VALUES OF NONWORK



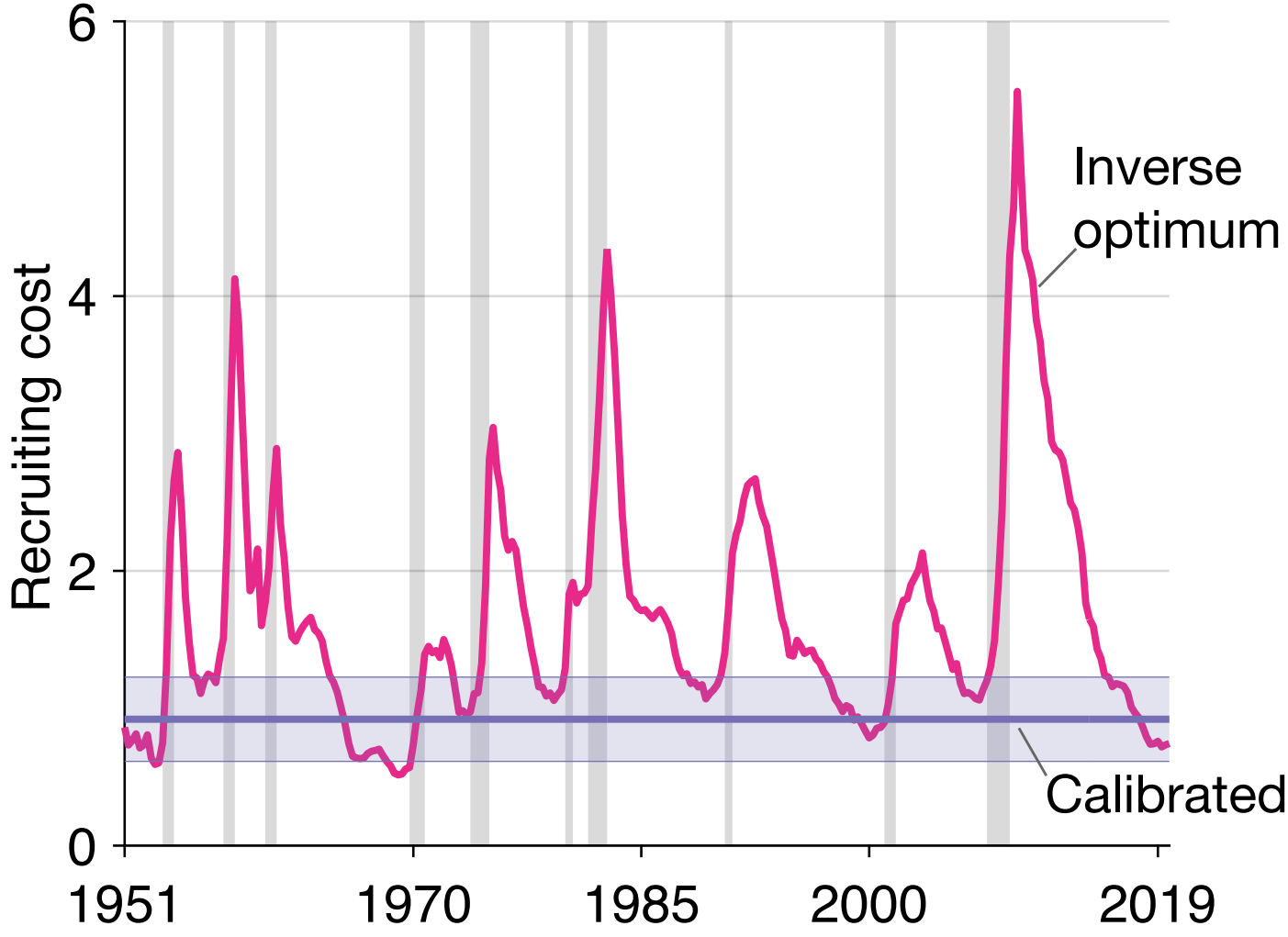
INVERSE-OPTIMUM ζ, SO $u = u^*$



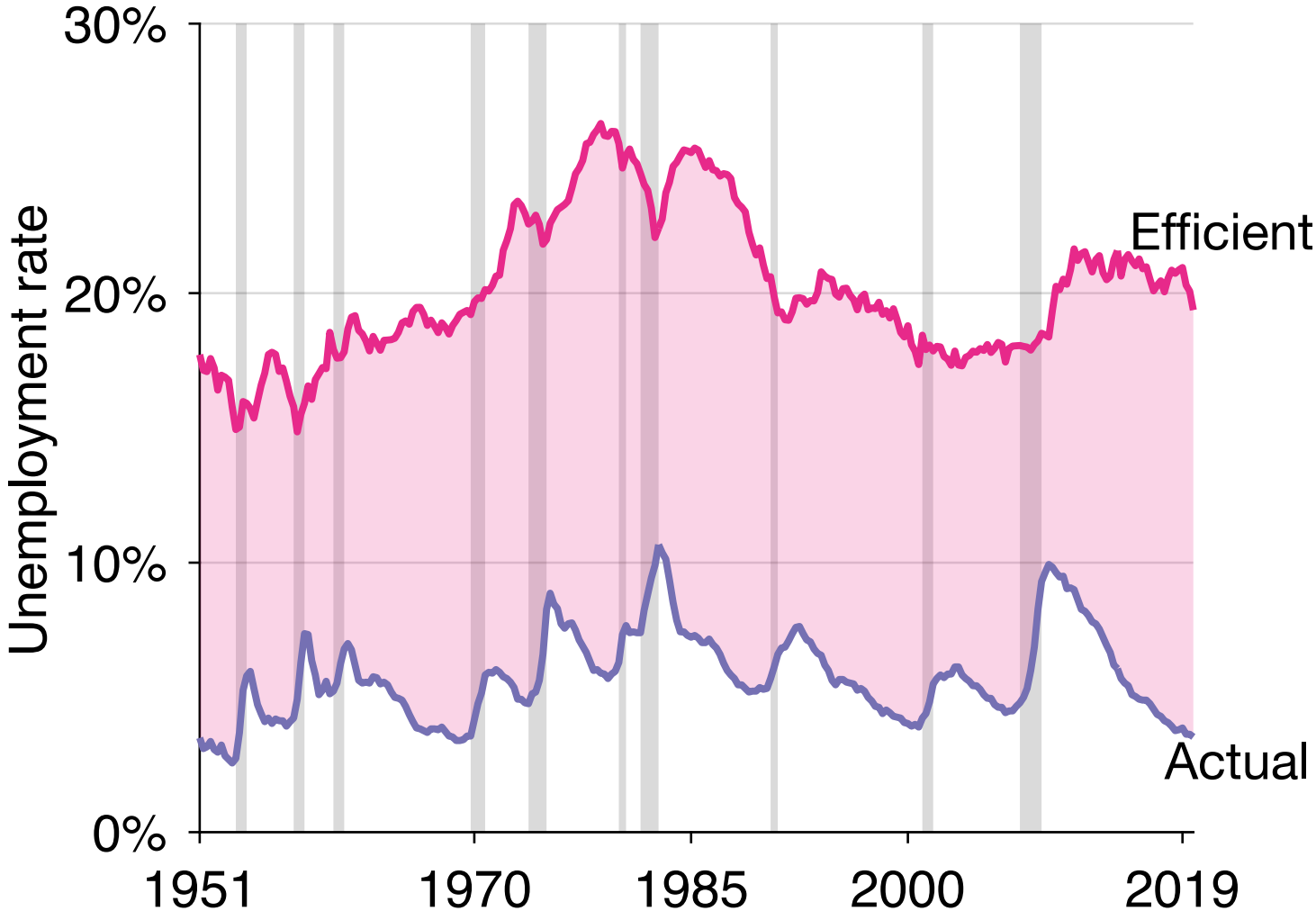
PLAUSIBLE RECRUITING COSTS



INVERSE-OPTIMUM κ, SO $u = u^*$



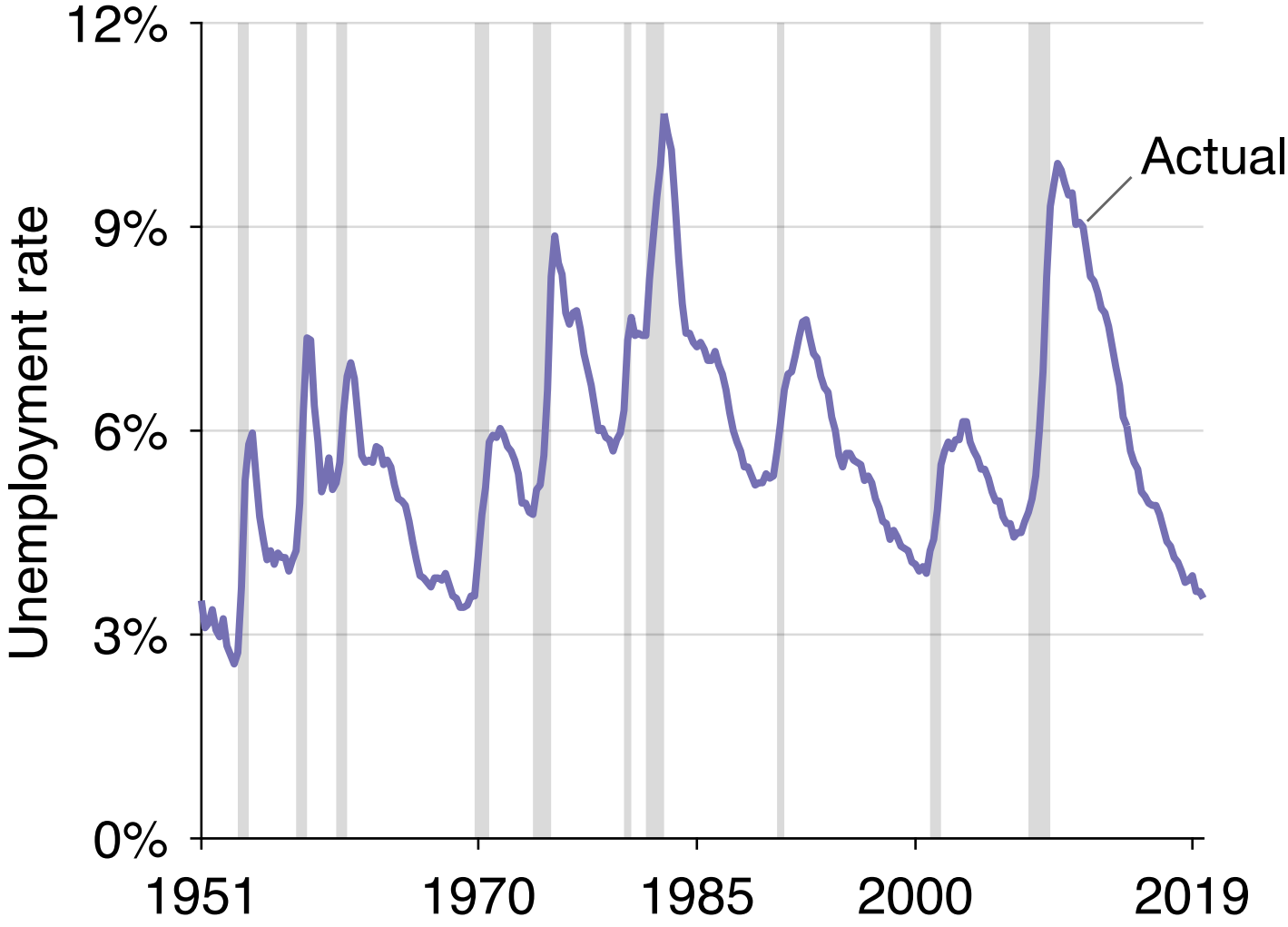
HAGEDORN, MANOVSKII (2008): $\zeta = 0.96$



APPLICATION TO

DIAMOND-MORTENSEN-PISSARIDES MODEL

UNEMPLOYMENT: ALWAYS ON DMP BEVERIDGE CURVE



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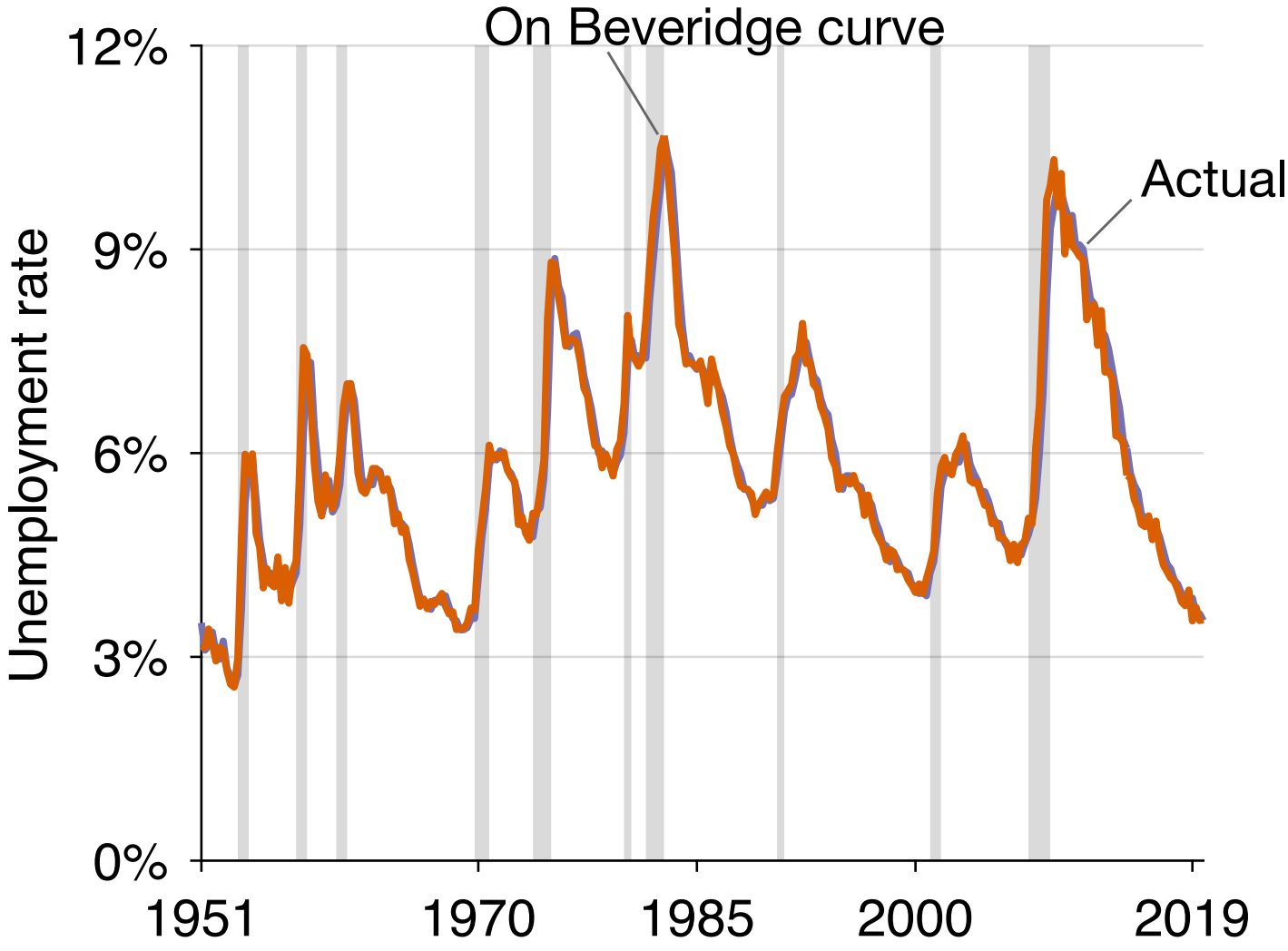


SUFFICIENT STATISTICS IN DMP MODEL

- Beveridge curve: UE flows = EU flows

$$v(u) = \left[\frac{\lambda \cdot (1-u)}{\omega \cdot u^{\eta}}\right]^{1/(1-\eta)}$$

⇝ Beveridge elasticity:

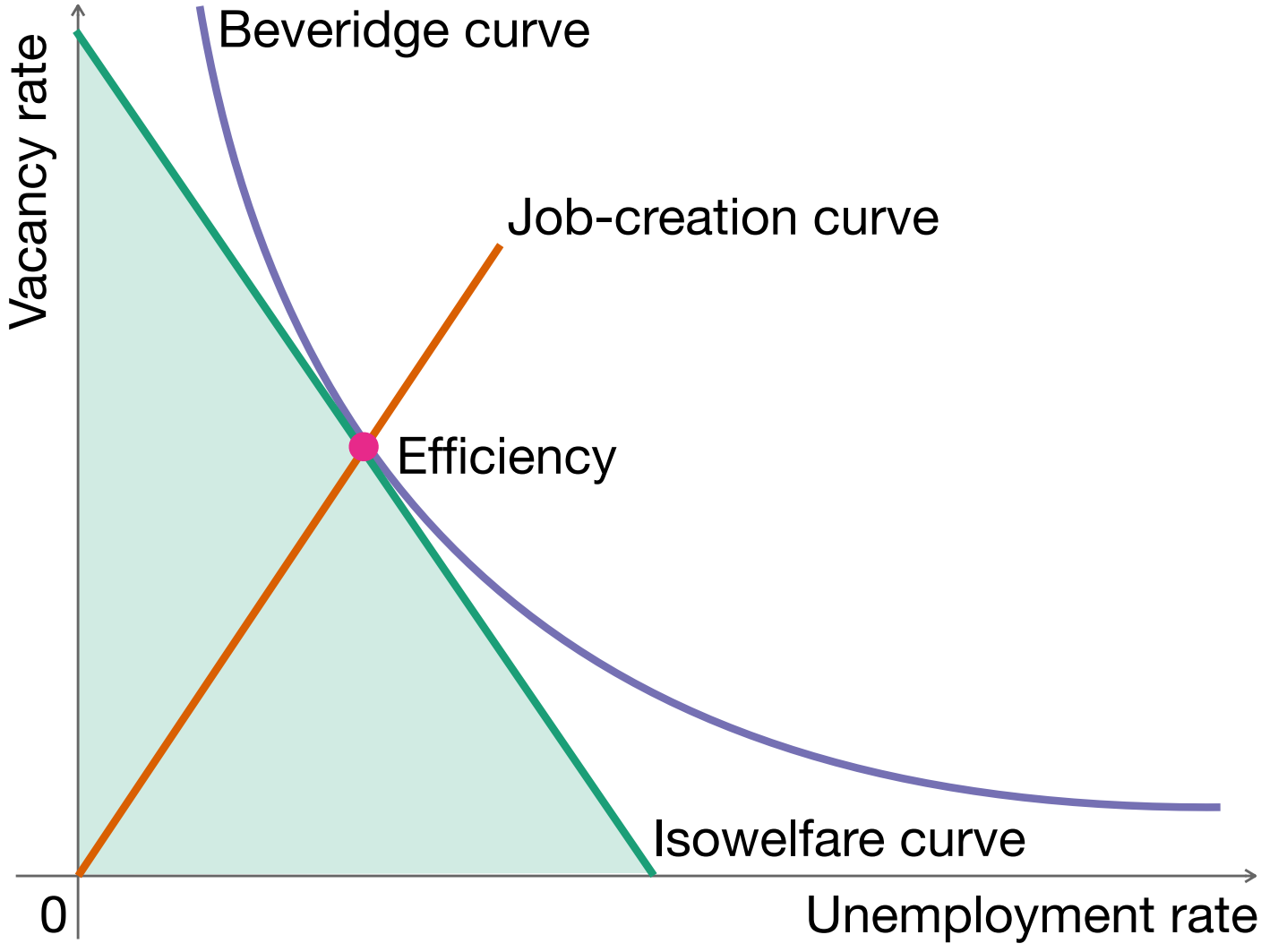
$$\epsilon = \frac{1}{1-\eta}\left[\eta + \frac{u}{1-u}\right]$$

- social welfare: $\mathcal{W}(n,u,v) = p \cdot (n + z \cdot u - c \cdot v)$

⇝ social value of nonwork: $\zeta = z$

⇝ recruiting cost: $\kappa = c$

DMP BUSINESS CYCLES IN BEVERIDGE DIAGRAM



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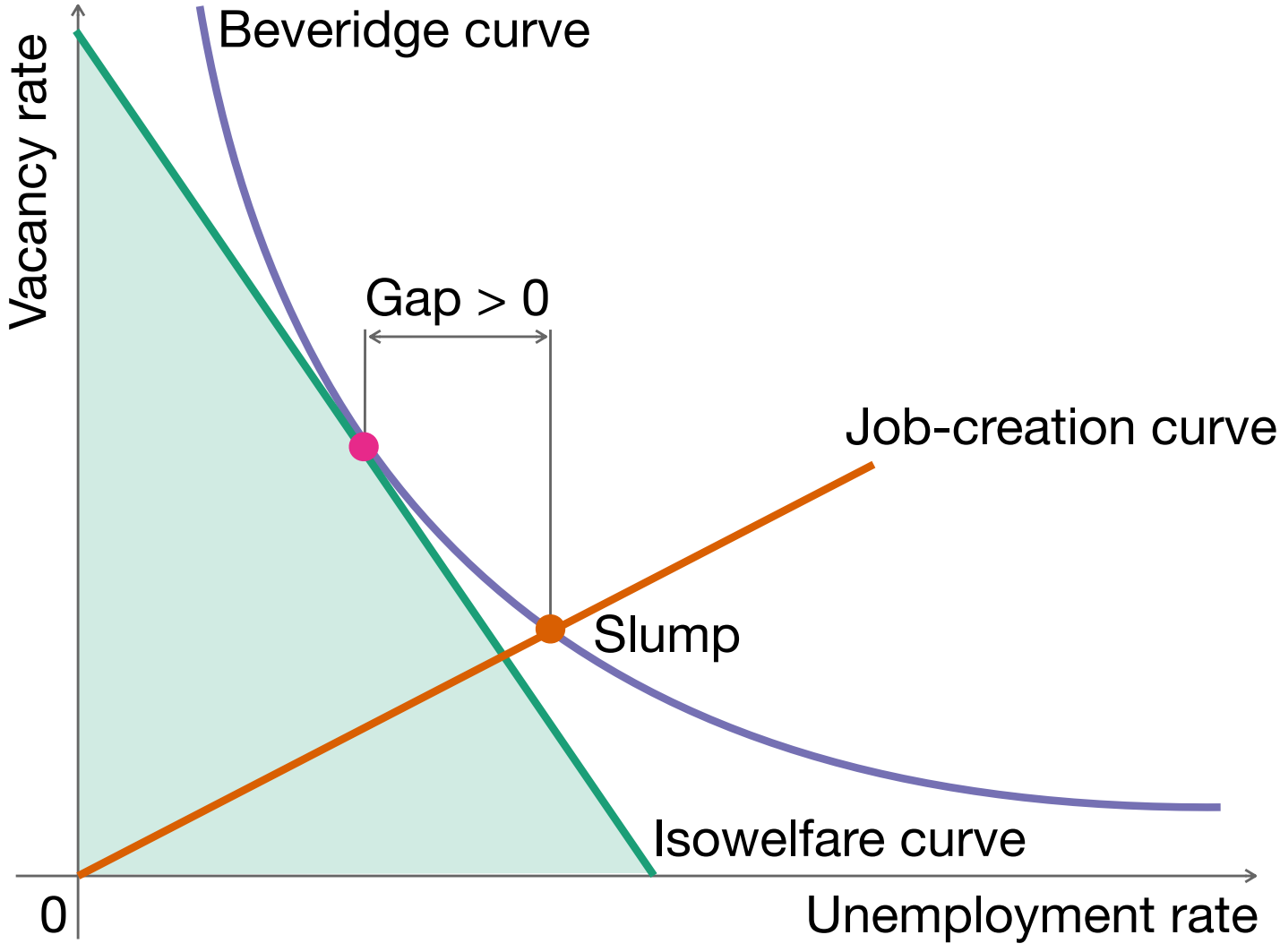

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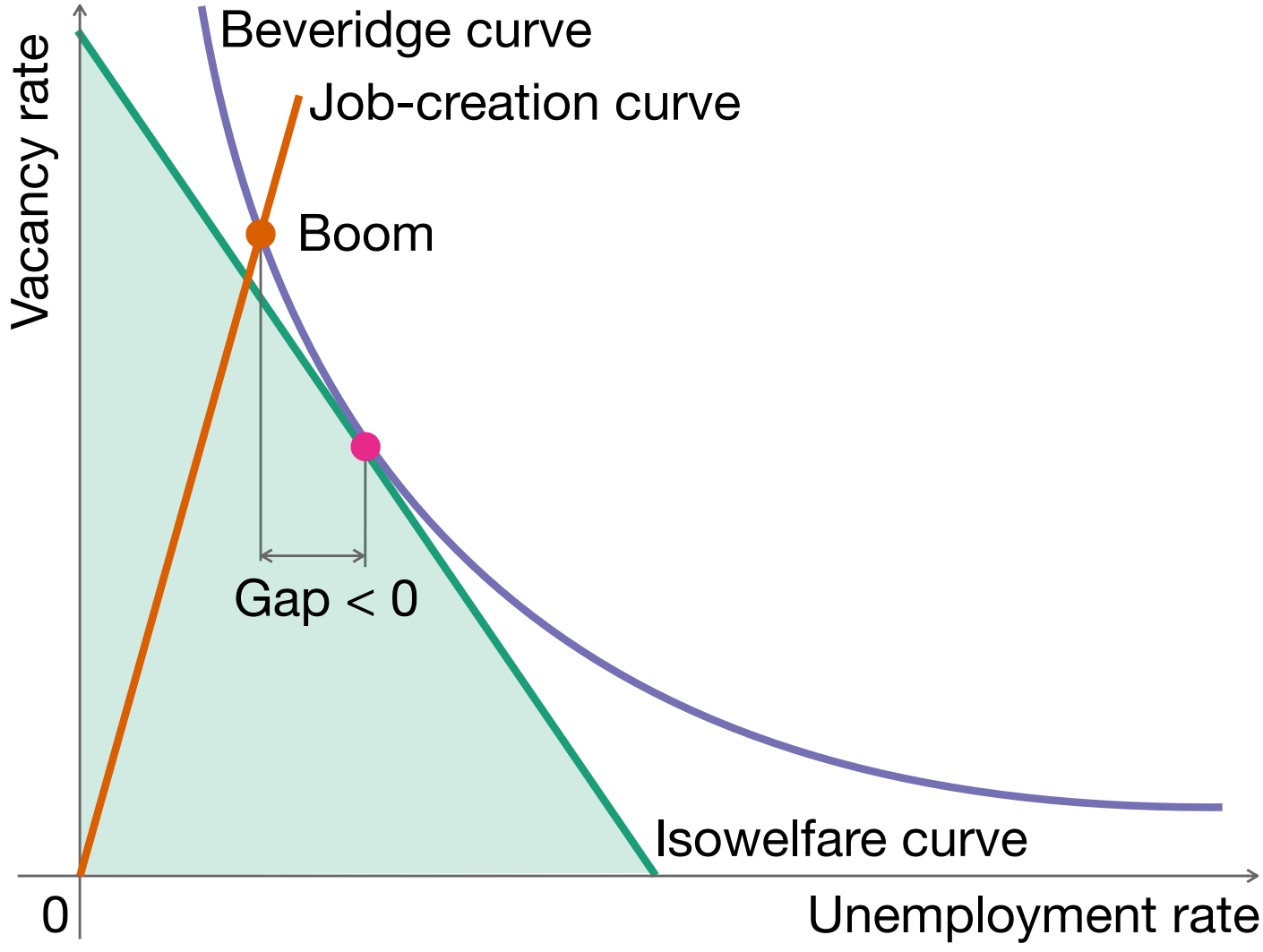
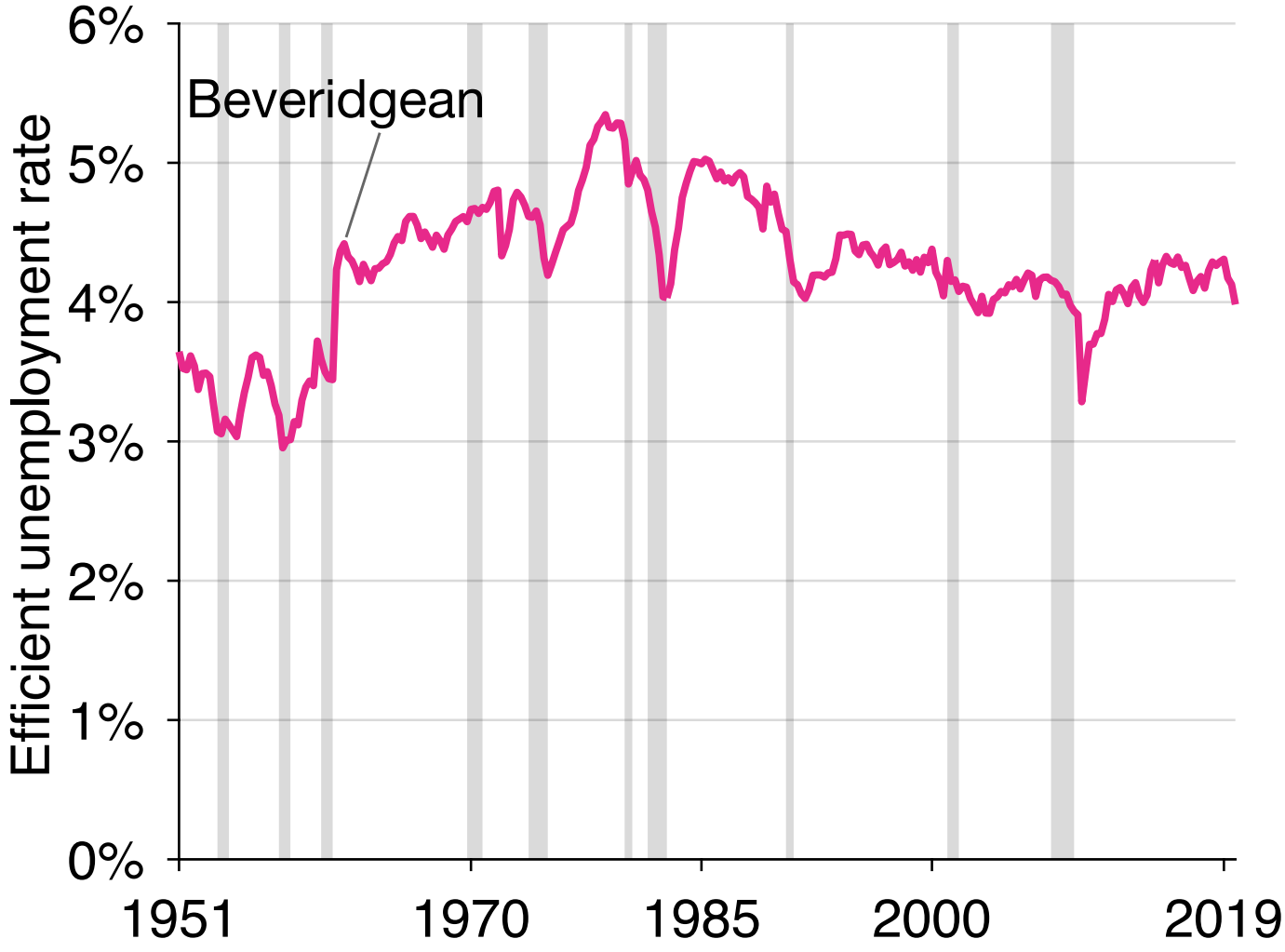


BEVERIDGEAN EFFICIENCY ≈ HOSIOSIAN EFFICIENCY



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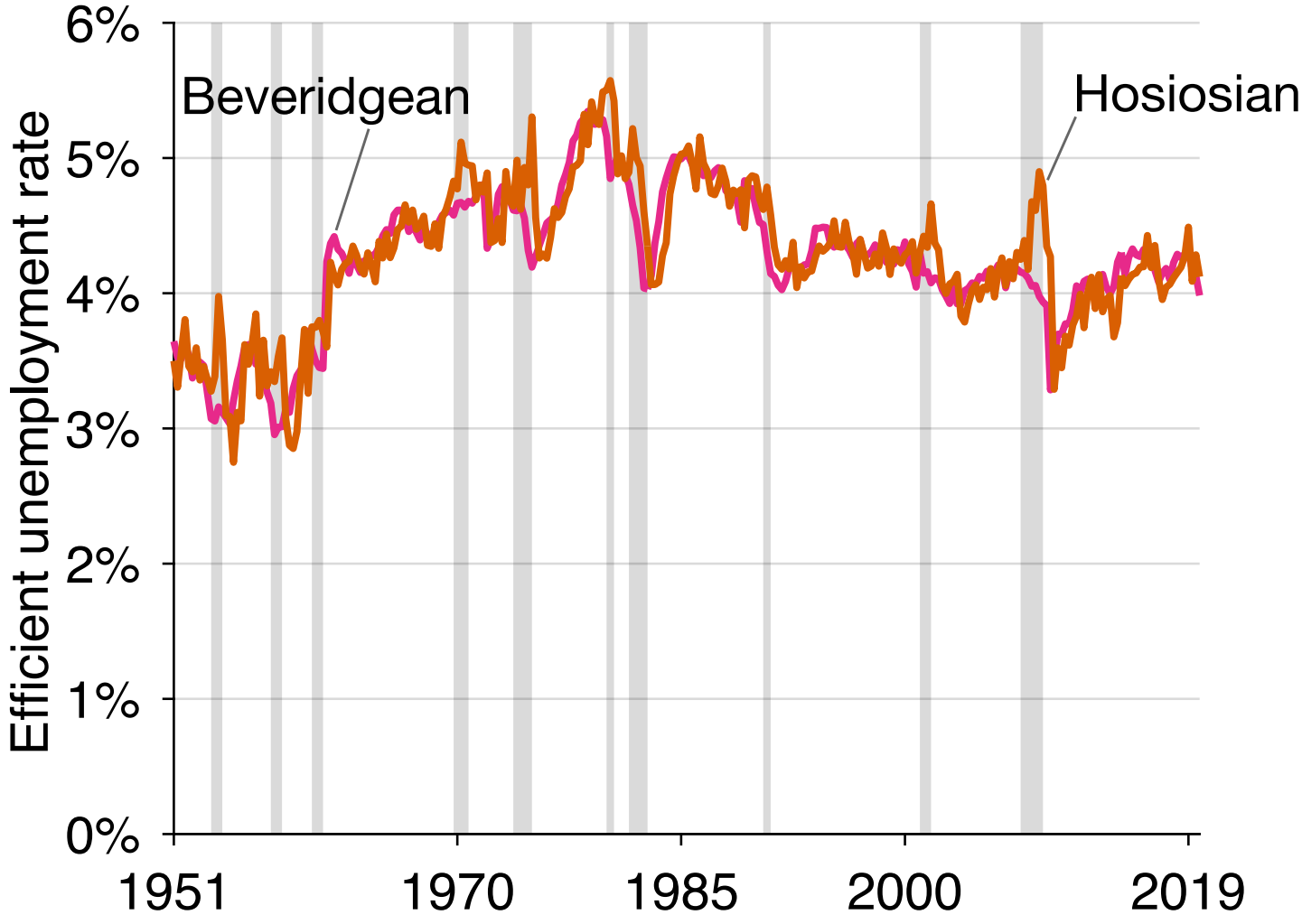

CONCLUSION

SUMMARY

- socially efficient unemployment rate u^* & unemployment gap $u - u^*$ are determined by 3 sufficient statistics
  - elasticity of Beveridge curve
  - social cost of unemployment
  - cost of recruiting
- in the United States, 1951–2019:
  - u^* averages 4.3% $\rightsquigarrow$ $u - u^*$ averages 1.4pp
  - $3.0\% < u^* < 5.4\%$ $\rightsquigarrow$ $u - u^*$ is countercyclical

$\rightsquigarrow$ labor market is inefficient

$\rightsquigarrow$ labor market is inefficiently slack in slumps

IMPLICATIONS FOR MODEL DESIGN

- models featuring an efficient labor market are inconsistent with our findings
  - DMP model with Hosios (1990) condition
  - models with competitive-search equilibrium (Moen 1997)
- models producing a countercyclical unemployment gap are consistent with our findings
  - DMP model with bargaining-power shocks (Shimer 2005)
  - variant of the DMP model with rigid wages (Hall 2005)

IMPLICATIONS FOR POLICY DESIGN

- optimal nominal interest rate is procyclical
  - optimal for monetary policy to eliminate the unemployment gap (Michaillat, Saez 2021)
  - unemployment ↑ when interest rate ↑ (Coibion 2012)
- optimal government spending is countercyclical
  - optimal for government spending to reduce—but not eliminate—the unemployment gap (Michaillat, Saez 2019)
  - unemployment ↓ when spending ↑ (Ramey 2013)

IMPLICATIONS FOR POLICY DESIGN

- optimal unemployment insurance is countercyclical
  - US tightness gap is procyclical
  - optimal for unemployment insurance to reduce the tightness gap (Landais, Michaillat, Saez 2018)
  - tightness ↑ when unemployment insurance ↑ (Landais, Michaillat, Saez 2018)