

BEVERIDGEAN UNEMPLOYMENT GAP

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Paper available at <https://pascalnichailat.org/9/>

DOES THE LABOR MARKET OPERATE EFFICIENTLY?

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

↪ model design

- bargained wages or competitive search?
- rigid wages?

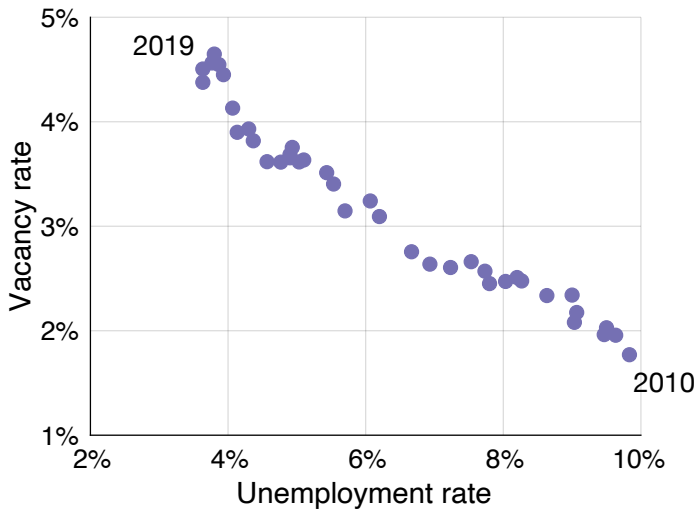
↪ distance from “full employment”

↪ optimal macro policies

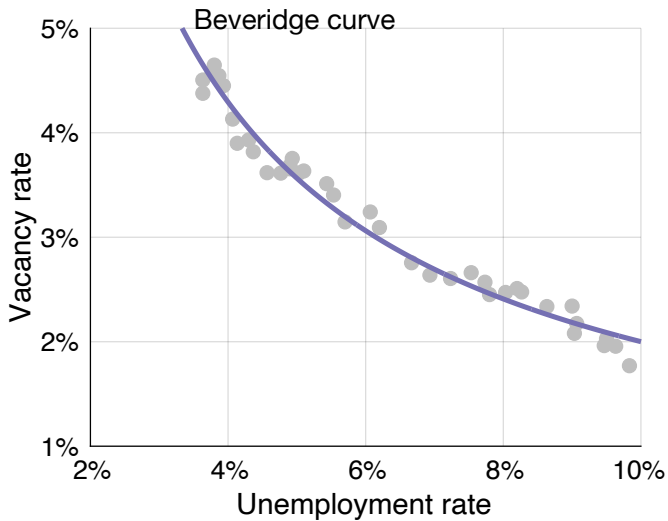
- monetary policy
- fiscal policy
- unemployment insurance

THEORY

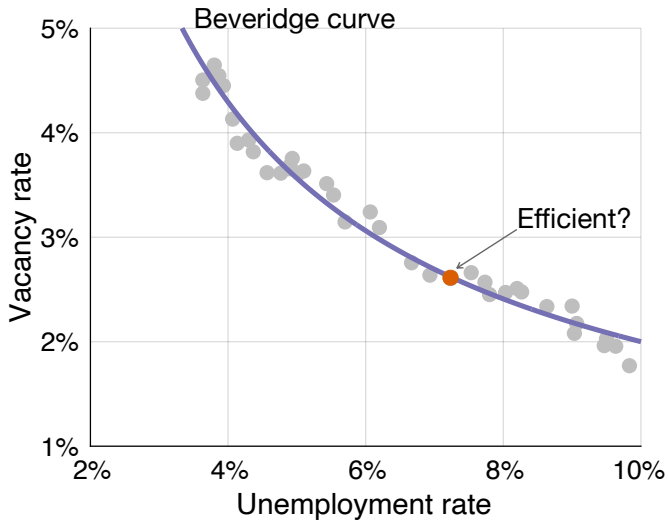
US BEVERIDGE CURVE



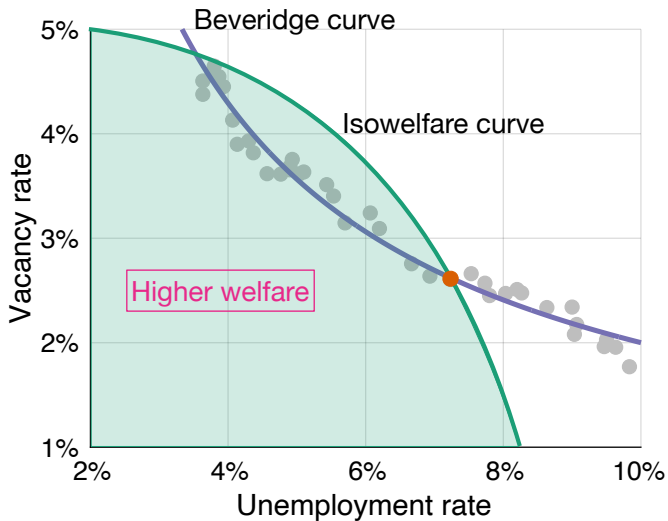
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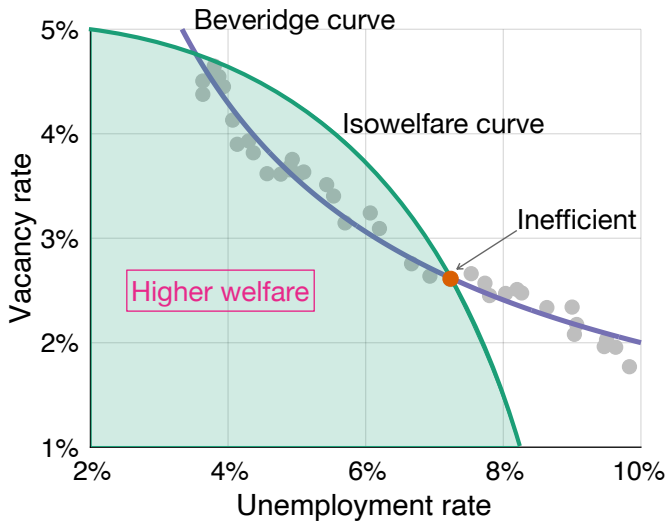
CONDITION FOR LABOR-MARKET EFFICIENCY



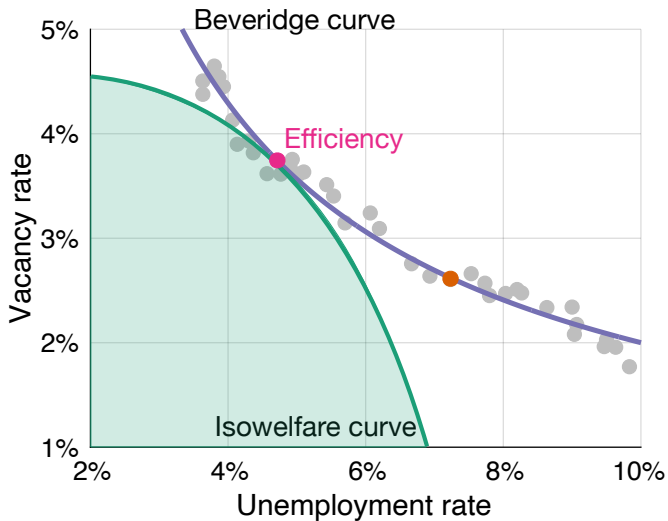
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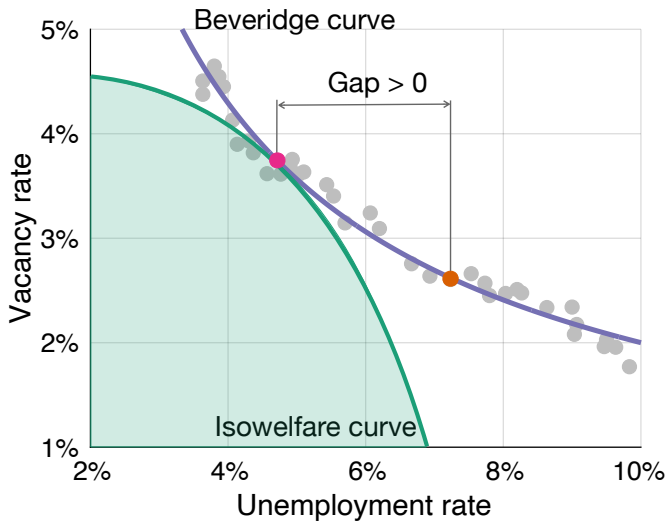
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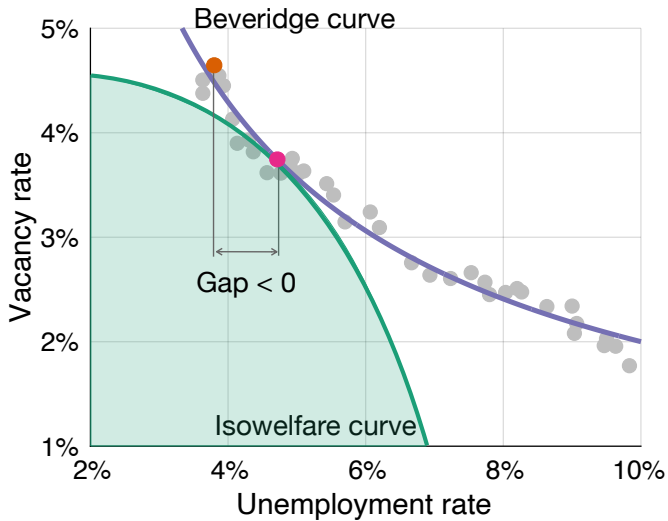
CONDITION FOR LABOR-MARKET EFFICIENCY



UNEMPLOYMENT GAP



UNEMPLOYMENT GAP



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: $\widehat{W}(u, v) = \mathcal{W}(n, u, v)$ with $n = 1 - u$
 - n : employment rate
 - \mathcal{W} : production + recruiting + preferences
 - $\widehat{W}(u, v)$: 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:

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

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

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

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- social value of nonwork: $\zeta = (\partial\mathcal{W}/\partial u)/(\partial\mathcal{W}/\partial n) < 1$
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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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- u^* obtained from θ^* through Beveridge curve

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

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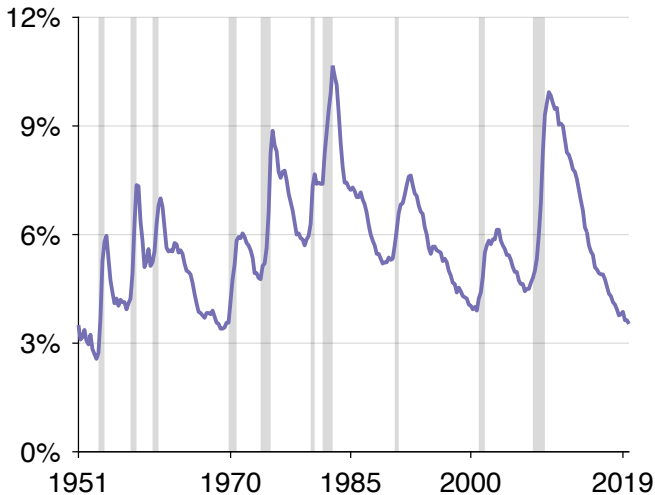
$$\theta^* = \frac{1 - \zeta}{\kappa \cdot \epsilon}$$

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

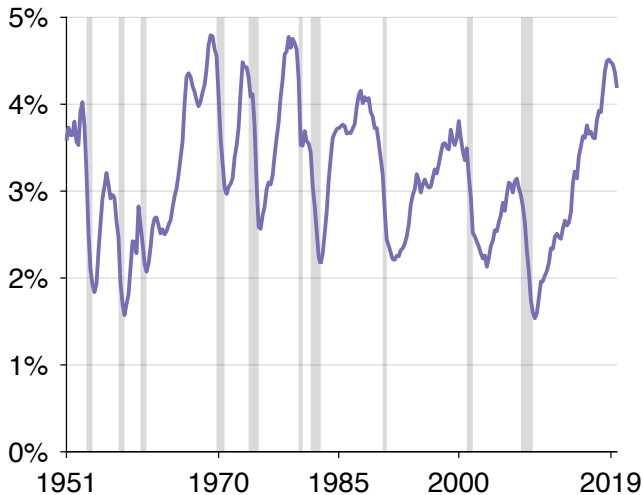
$$u^* = \left(\frac{\kappa \cdot \epsilon}{1 - \zeta} \cdot \frac{v}{u^{-\epsilon}} \right)^{1/(1+\epsilon)}$$

APPLICATION TO THE UNITED STATES

UNEMPLOYMENT RATE (CPS)



VACANCY RATE (BARNICHON 2010 & JOLTS)



BEVERIDGE-CURVE BRANCHES (BAI, PERRON 1998)



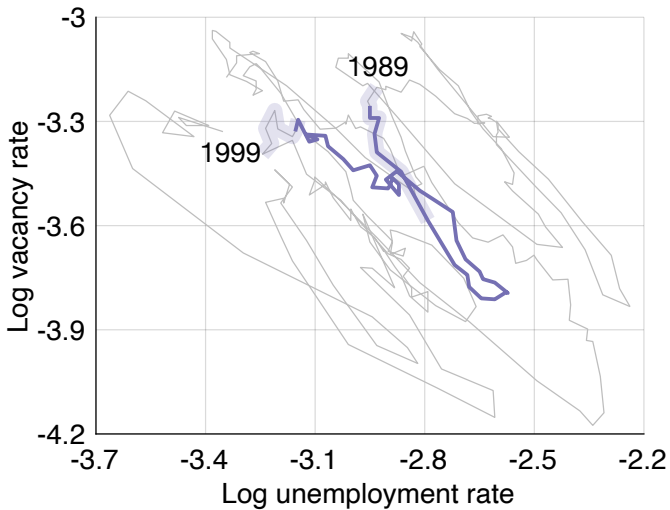
BEVERIDGE-CURVE BRANCHES (BAI, PERRON 1998)



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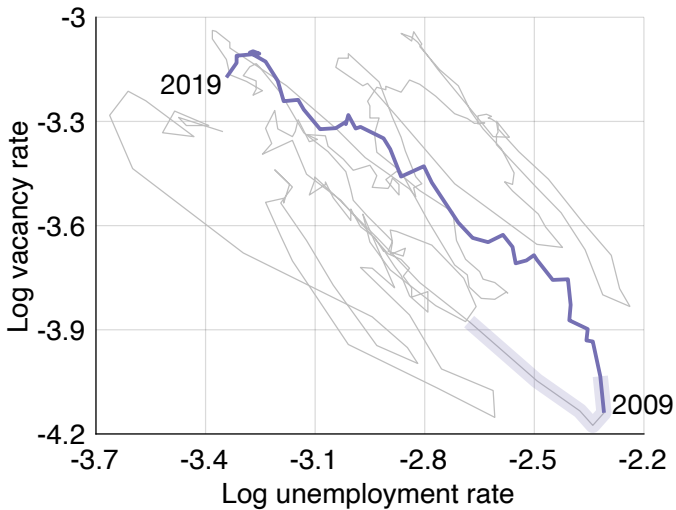
BEVERIDGE-CURVE BRANCHES (BAI, PERRON 1998)



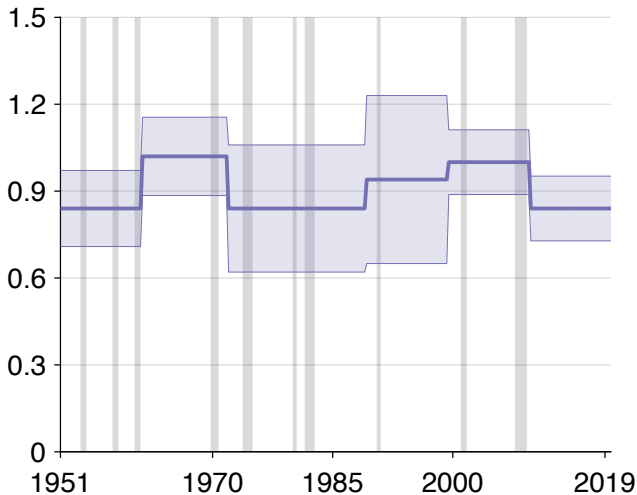
BEVERIDGE-CURVE BRANCHES (BAI, PERRON 1998)



BEVERIDGE-CURVE BRANCHES (BAI, PERRON 1998)



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

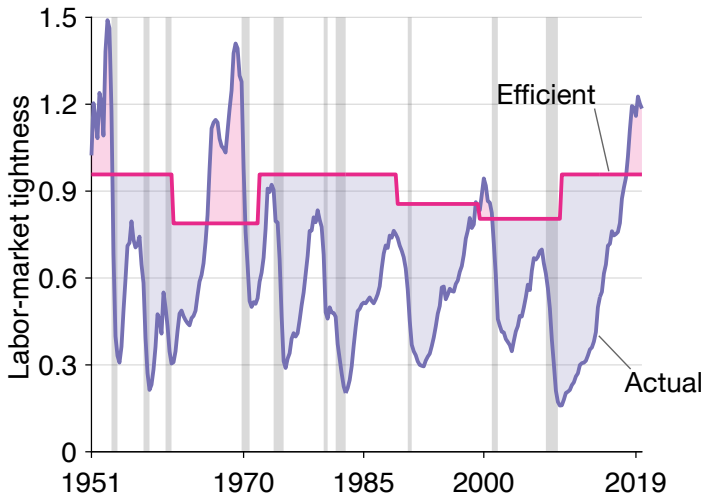
⇒ $\zeta \in [0.03, 0.49]$, with median value of $\zeta = 0.26$

RECRUITING COST

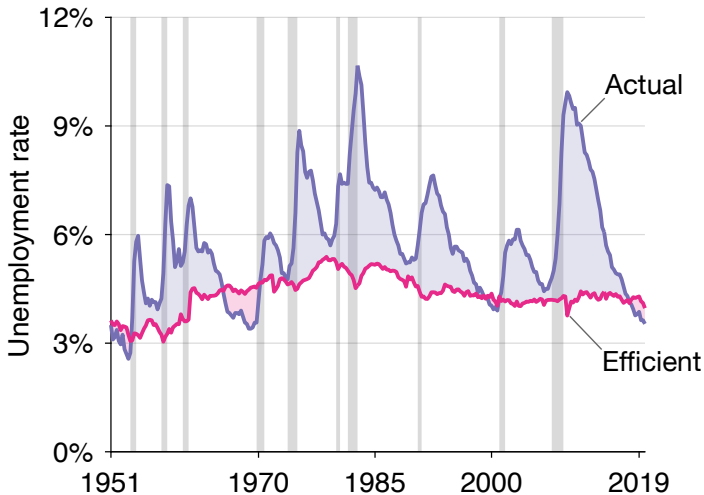
- 1997 National Employer Survey, administered by Census Bureau
 - 2,000 establishments
 - establishments have ≥ 20 workers
 - establishments belong to all industries
- recruiting = 3.2% of labor costs

⇒ $\kappa = 0.92$

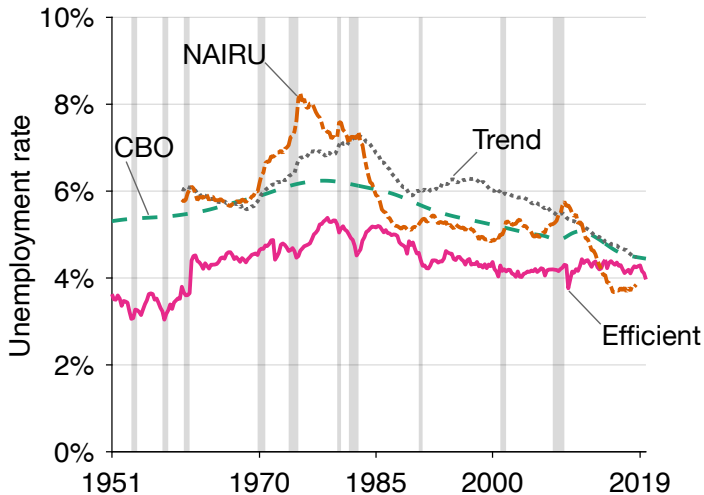
EFFICIENT TIGHTNESS & TIGHTNESS GAP



EFFICIENT UNEMPLOYMENT & UNEMPLOYMENT GAP

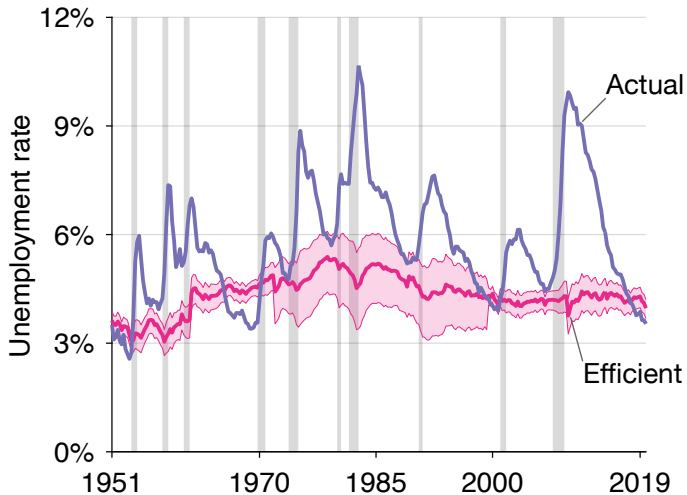


COMPARISON WITH EXISTING “NATURAL RATES”

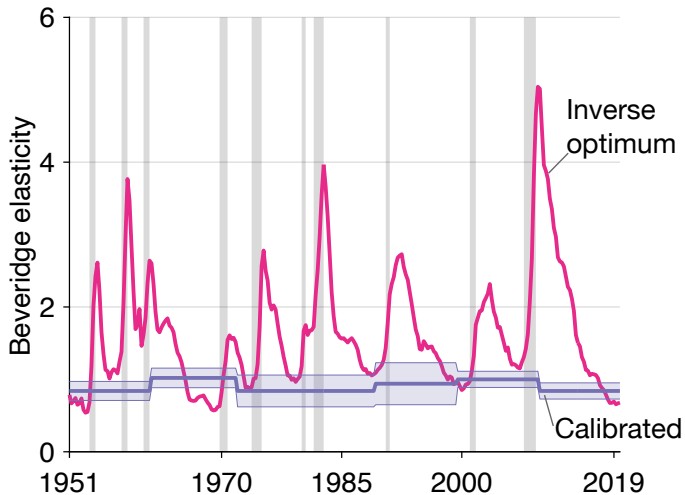


ALTERNATIVE CALIBRATIONS OF STATISTICS

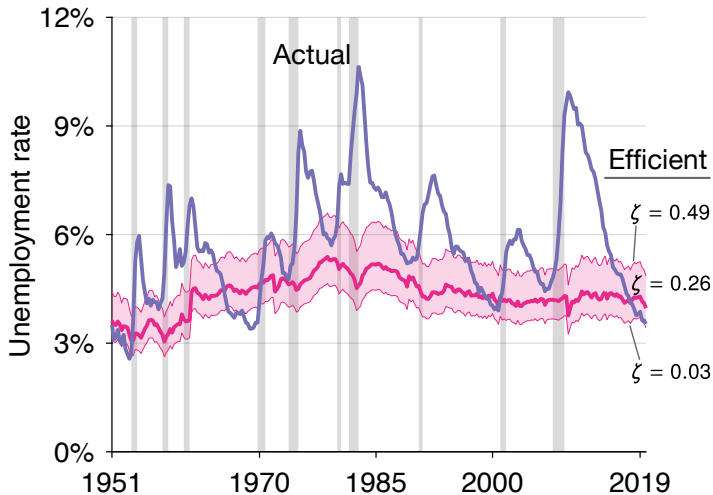
BEVERIDGE ELASTICITY IN 95% CI



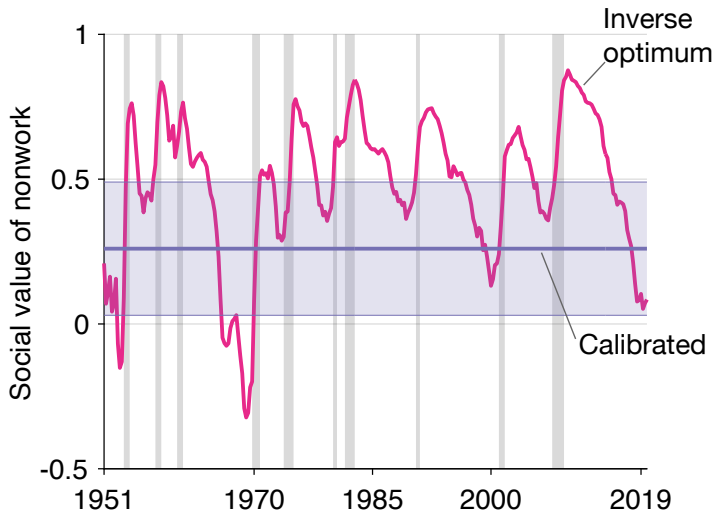
INVERSE-OPTIMUM ϵ , SO $u = u^*$



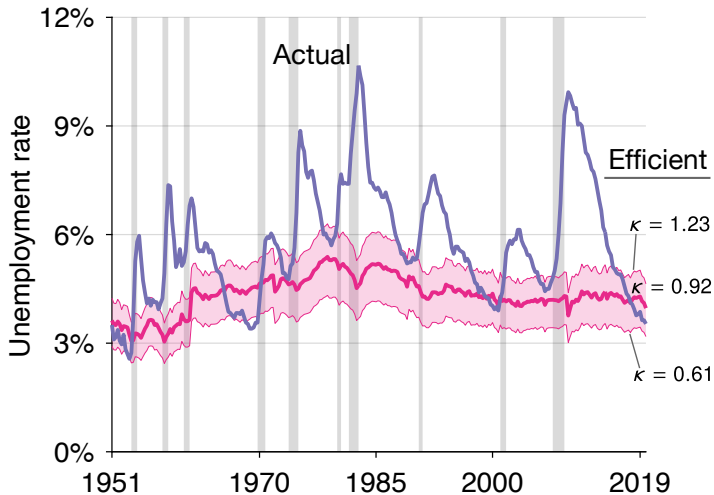
PLAUSIBLE SOCIAL VALUES OF NONWORK



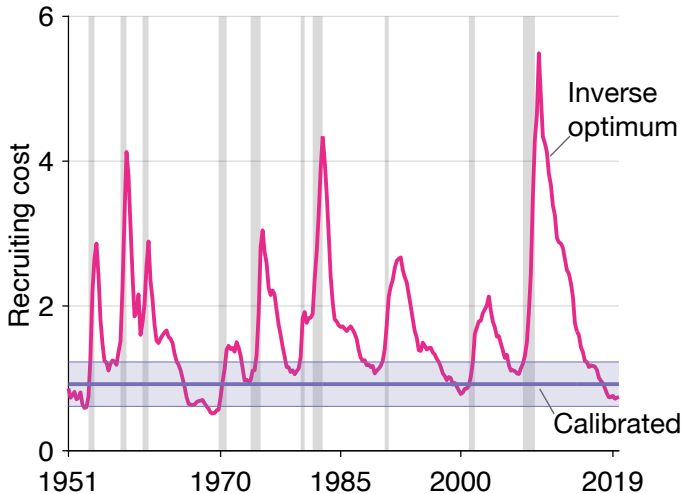
INVERSE-OPTIMUM ζ , SO $u = u^*$



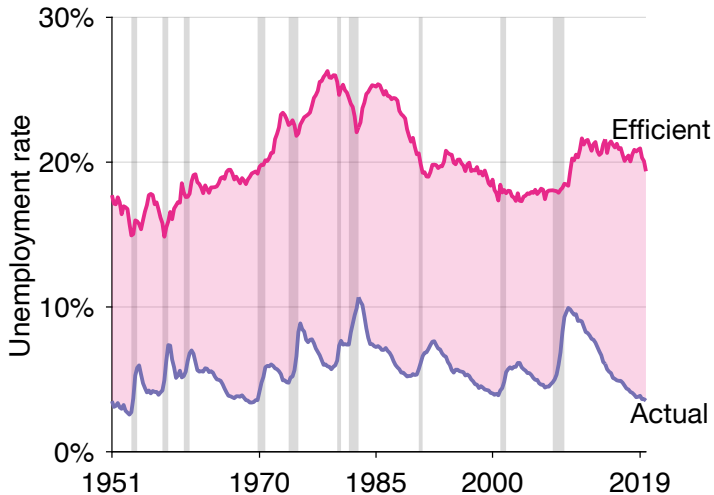
PLAUSIBLE RECRUITING COSTS



INVERSE-OPTIMUM κ , SO $u = u^*$



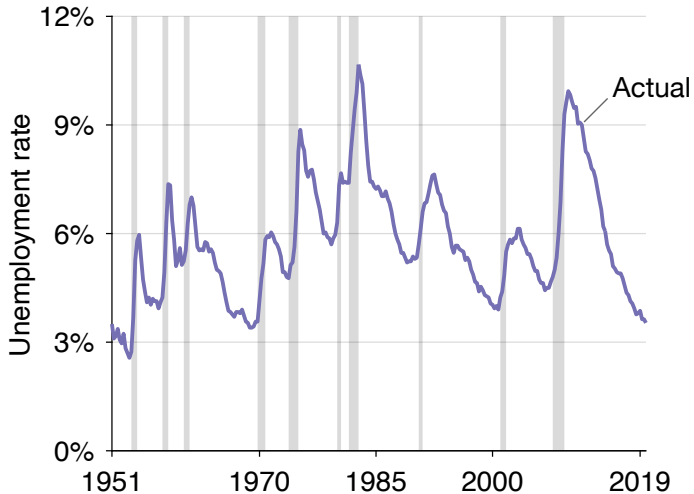
HAGEDORN, MANOVSKII (2008): $\zeta = 0.96$



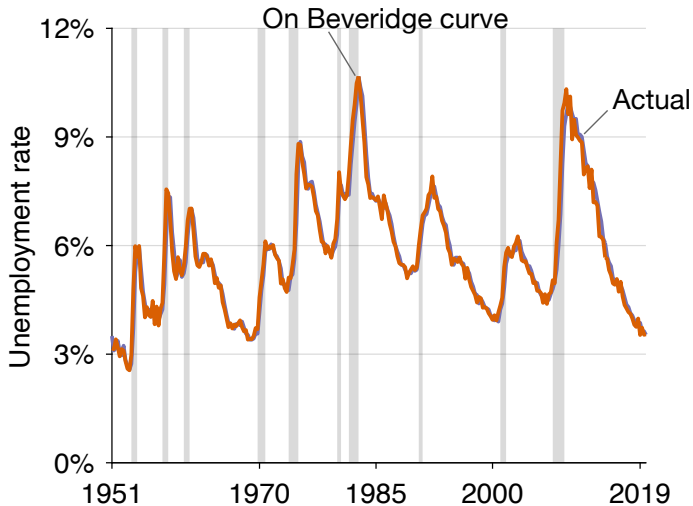
APPLICATION TO

DIAMOND-MORTENSEN-PISSARIDES MODEL

UNEMPLOYMENT: ON DMP BEVERIDGE CURVE



UNEMPLOYMENT: ON DMP BEVERIDGE CURVE



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:

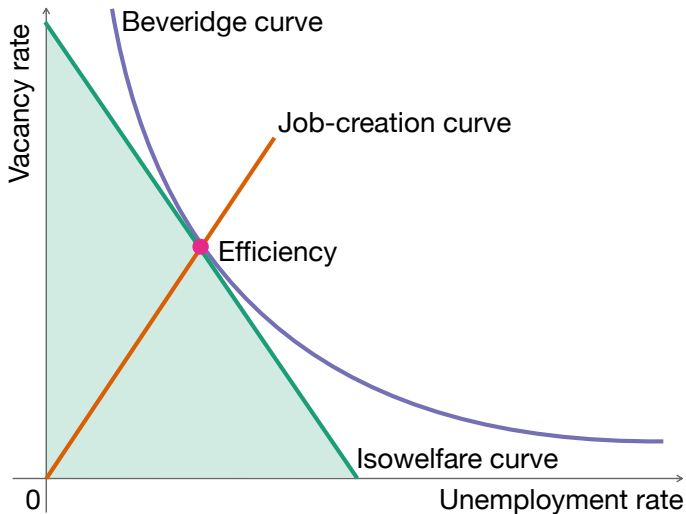
$$\epsilon = \frac{1}{1-\eta} \left[\eta + \frac{u}{1-u} \right]$$

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

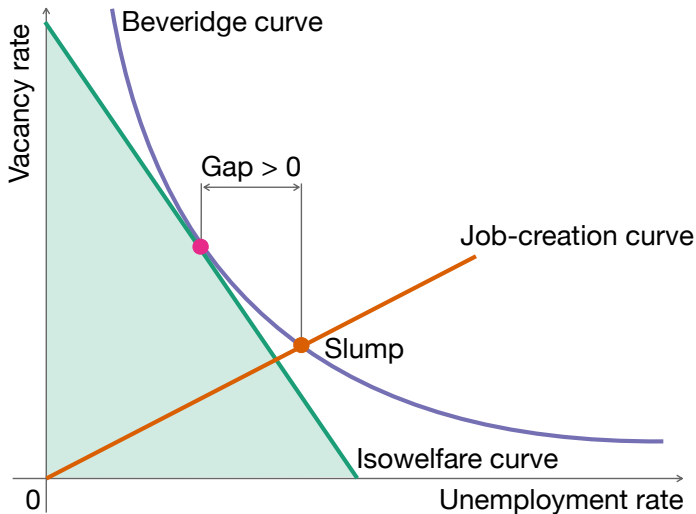
↪ social value of nonwork: $\zeta = z$

↪ recruiting cost: $\kappa = c$

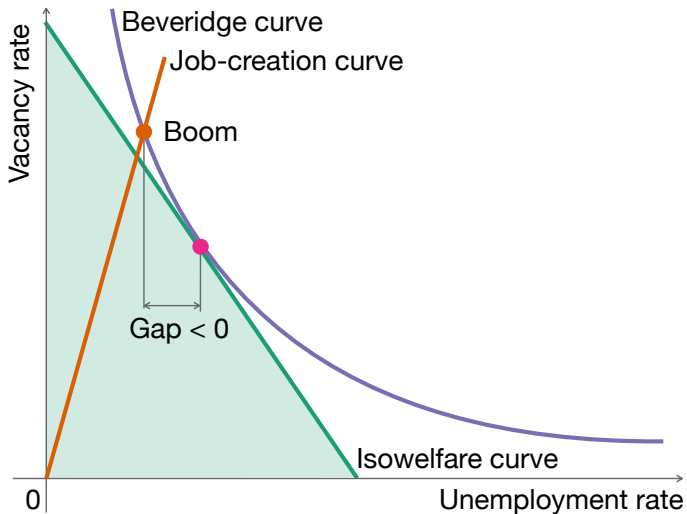
DMP BUSINESS CYCLES IN BEVERIDGE DIAGRAM



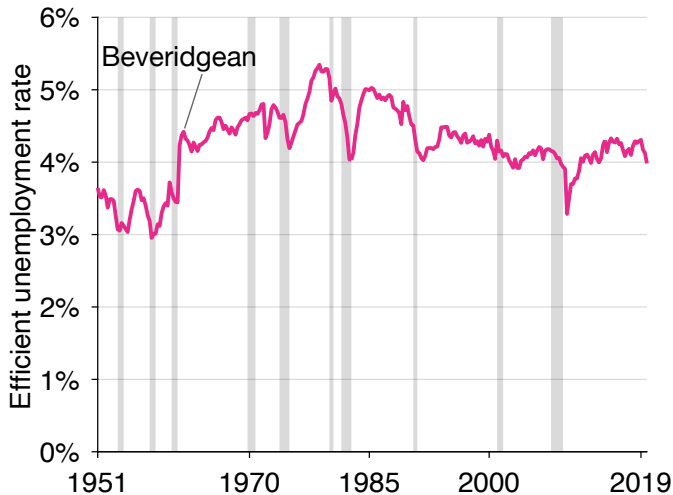
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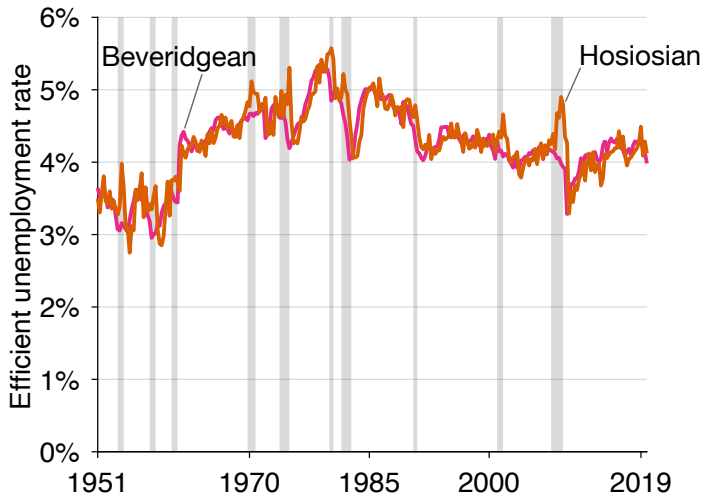
DMP BUSINESS CYCLES IN BEVERIDGE DIAGRAM



BEVERIDGEAN EFFICIENCY \approx 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 \uparrow when interest rate \uparrow (Coibion 2012)
- optimal **government spending** is **countercyclical**
 - optimal for government spending to reduce—but not eliminate—the unemployment gap (Michaillat, Saez 2019)
 - unemployment \downarrow when spending \uparrow (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 \uparrow when unemployment insurance \uparrow (Landais, Michaillat, Saez 2018)