BEVERIDGEAN UNEMPLOYMENT GAP

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UNEMPLOYMENT GAP: KEY FOR MACRO POLICIES

• US government mandate is to achieve “full employment”
  – unemployment gap = distance from “full employment”

• optimal macro policies depend on distance from efficiency
  – monetary policy, fiscal policy, labor subsidies/taxes
  – unemployment gap = distance from efficiency
CHALLENGES IN MEASURING UNEMPLOYMENT GAP

1. statistical approach (CBO)
   - trend unemployment generally not efficient

2. Phillips-curve approach
   - based on inflation dynamics but not welfare

3. our approach: based on welfare in matching model
   - same welfare concept as Hosios (1990)
   - but applicable to any matching model
   - and implementable with observable statistics
OVERVIEW OF THE METHOD: 2009–2019

The graph shows the relationship between unemployment rate and vacancy rate from 2010:Q1 to 2019:Q3. The x-axis represents the unemployment rate, ranging from 2% to 10%, while the y-axis represents the vacancy rate, ranging from 1% to 5%. The data points indicate a decreasing trend in unemployment rate as the vacancy rate increases.
OVERVIEW OF THE METHOD: 2009–2019

Beveridge curve

Vacancy rate

Unemployment rate
OVERVIEW OF THE METHOD: 2009–2019

Unemployment rate

Vacancy rate

Beveridge curve

Iso-welfare curve
OVERVIEW OF THE METHOD: 2009–2019

Unemployment rate

Vacancy rate

Beveridge curve

Iso-welfare curve

\( u^* = 3.7\% \)
THEORY
BEVERIDGE CURVE

- Beveridge curve: \( v(u) \)
  - \( v \): vacancy rate
  - \( u \): unemployment rate
  - decreasing, convex

- present in many countries (Elbsy, Michaels, Ratner 2015)

- present in many models
  - matching (Diamond-Mortensen-Pissarides + variants)
  - mismatch (Shimer 2007)
  - stock-flow matching (Ebrahimi, Shimer 2010)
SOCIAL WELFARE

- recruiting cost: $\rho$ workers / vacancy
- social value of unemployment / employment: $z$
- social welfare (Hosios 1990): 

\[(1 - u) + u \cdot z - \rho \cdot v(u)\]

- first-order condition wrt $u$ to maximize welfare:

\[ -1 + z - \rho \cdot v'(u) = 0 \]

\[ v'(u) = -\frac{1 - z}{\rho} \]
Unemployment rate
Vacancy rate
Beveridge curve: $v(u)$

Iso-welfare curve:
slope $= -(1 - z)/\rho$

$0$

Unemployment rate
EFFICIENT UNEMPLOYMENT & BUSINESS CYCLES

Slump

Unemployment rate

Vacancy rate

Beveridge

$u > u^*$

Slump

Iso-welfare
Unemployment rate
Vacancy rate
Beveridge
Boom
Iso-welfare
$u < u^*$
COSTLIER UNEMPLOYMENT

Unemployment rate

Vacancy rate

Beveridge

Iso-welfare

$u^*$
WORSE MISMATCH

Unemployment rate
Vacancy rate
Beveridge
$u^*$
Iso-welfare

Unemployment rate
Vacancy rate
MEASUREMENT
• labor market tightness: $\theta = v/u$

• Beveridge elasticity: $\epsilon = -d \ln(v)/d \ln(u) = -v'(u)/\theta$

• efficient labor market tightness: $\theta^*$

$$v'(u) = -\frac{1 - z}{\rho}$$

$$-\frac{v'(u)}{\theta} \cdot \theta = \frac{1 - z}{\rho}$$

$$\theta^* = \frac{1 - z}{\rho \epsilon}$$

• $u - u^*$ obtained from $\theta - \theta^*$ through Beveridge curve
LOG BEVERIDGE CURVE: 1959–1971

-4.2  -3.9  -3.6  -3.3  -3.0  
Log unemployment rate

-3.7  -3.4  -3.1  -2.8  -2.5  
Log vacancy rate

Log unemployment rate vs. Log vacancy rate for the years 1959–1971.
LOD BEVERIDGE CURVE: 1971–1975

Log unemployment rate

-4.2
-3.9
-3.6
-3.3
-3

Log vacancy rate

-3.7 -3.4 -3.1 -2.8 -2.5 -2.2
LOG BEVERIDGE CURVE: 1975–1987

![Graph showing the relationship between log unemployment rate and log vacancy rate between 1975 and 1987.]
LOG BEVERIDGE CURVE: 1990–1999

- Log unemployment rate
  -4.2
  -3.9
  -3.6
  -3.3
  -3.0

- Log vacancy rate
  -3.7
  -3.4
  -3.1
  -2.8
  -2.5
  -2.2
LOG BEVERIDGE CURVE: 2001–2009

Log unemployment rate

Log vacancy rate

Log unemployment rate

Log vacancy rate
LOG BEVERIDGE CURVE: 2010–2019

Log vacancy rate
-3.7 -3.4 -3.1 -2.8 -2.5 -2.2

Log unemployment rate
-4.2 -3.9 -3.6 -3.3 -3.0

LOG BEVERIDGE CURVE: 2010–2019

\[ \varepsilon = 0.82 \]
RECRUITING COST & VALUE OF UNEMPLOYMENT

• recruiting cost: 1997 National Employer Survey (Villena 2010)
  - 4,500 establishments
  - firms spend 2.5% of labor costs on recruiting
  \[ \rho = 0.72 \]

• value of unemployment: military administrative data for 1993–2004 (Borgschulte, Martorell 2018)
  - 420,000 veterans
  - during unemployment: 13%–35% of earnings loss is offset by leisure and home production
  \[ z = 0.24 \]
EFFICIENT UNEMPLOYMENT & UNEMPLOYMENT GAP

![Graph showing efficient and actual unemployment rates from 1951 to 2019. The x-axis represents years from 1951 to 2019, and the y-axis represents the unemployment rate ranging from 0% to 12%. The graph compares actual unemployment (purple line) and efficient unemployment (pink line). Peaks and troughs indicate fluctuations in unemployment rates over time.](image-url)
ALTERNATIVE CALIBRATIONS OF Z
BASELINE EFFICIENT UNEMPLOYMENT RATE

![chart showing baseline efficient unemployment rate from 1951 to 2019]
LOWER BOUND: $z = 0$

![Graph showing unemployment rates with lower bounds $z = 0$ and $z = 0.24$.](image)
CHODOROW-REICH, KARABARBOUNIS (2016): $z = 0.4$
HAGEDORN, MANOVSKII (2008): \( z = 0.96 \)
MINNESOTA Z: NO UNEMPLOYMENT GAP