Optimal Public Expenditure
with Inefficient Unemployment

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should macroeconomic concerns affect policy?

• in practice, they already do:
  – monetary policy
  – unemployment insurance

• but other policies could depend on macroeconomic conditions

• in this paper: public expenditure
existing theories of optimal public expenditure

- Samuelson (1954):
  - public goods financed by lump-sum taxation
  - efficient level of production
  - rule: spend until marginal utilities are equalized
  - what if production is inefficient?

- Keynes:
  - in recession, multiplier of public expenditure $> 1$
  - rule: spend to fill output gap
  - what happens with multiplier $< 1$?
  - role of social value of public good? of taxation?
our theory of optimal public expenditure

- blends theories of Samuelson + Keynes
- by embedding Samuelson’s framework into matching model from Michaillat & Saez (2015)
- outcome: a formula linking optimal stimulus spending to
  - unemployment gap
  - unemployment multiplier
  - social value of government consumption
informal description of the model
this is a service economy, without firms
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there is an asset for saving
there are private services \((c)\) and public services \((g)\)
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matching: it is costly to purchase services
matching: there is unemployment (high or low)
matching: there is unemployment (high or low)
the efficient rate of unemployment is positive

- too much unemployment is bad
  - too many services are idle

- too little unemployment is bad
  - too many services are devoted to recruiting

- there is a positive efficient rate of unemployment \( (u^*) \)
  - the number of services enjoyed \( (y = g + c) \) is maximized

- when the unemployment rate is efficient, Samuelson rule holds
optimal stimulus spending
formula for optimal stimulus spending

\[ \text{stimulus} = A \cdot \frac{\varepsilon \cdot m}{1 + B \cdot \varepsilon \cdot m^2} \cdot (u - u^*) \]

- **stimulus**: public spending - Samuelson spending
- **$u - u^*$**: initial unemployment gap
- **$\varepsilon$**: elasticity of substitution between $g$ and $c$
  - marginal social value of public spending
- **$m$**: unemployment multiplier
  - decrease in $u$ when $g$ increases by 1% of $y$
  - same as output multiplier
sign of stimulus spending, for different unemployment gaps and unemployment multipliers

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numerical illustration:

Great Recession in the US
starting point: winter 2008–2009

- unemployment = 6% and public spending = 16.5% of GDP
  - for illustration: we take these values as efficient
- unemployment is forecast to increase to 9%
  - initial unemployment gap = 9% − 6% = 3%
- we compute optimal stimulus for various elasticities of substitution and unemployment multipliers
optimal stimulus spending (% of GDP)

\[ \epsilon = 1 \]
optimal stimulus spending (% of GDP)
optimal stimulus spending (% of GDP)
optimal stimulus spending (% of GDP)

unemployment multiplier

$520 billion
optimal stimulus spending (% of GDP)
optimal stimulus spending (% of GDP)
more on the elasticity of substitution between public and private services

- \( \varepsilon = 0 \): public services = digging holes
  - stimulus = 0

- \( \varepsilon = +\infty \): public services = private services
  - entirely fill unemployment gap

- \( 0 < \varepsilon < +\infty \): medium substitution
  - stimulus > 0
  - but only partially fill unemployment gap
unemployment with optimal stimulus

\[ \frac{\epsilon}{\text{unemployment multiplier}} = \frac{2}{2} = 1 \]

\[ \frac{\epsilon}{\text{unemployment multiplier}} = \frac{1}{2} = 0.5 \]

\[ \frac{\epsilon}{\text{unemployment multiplier}} = \frac{0.5}{2} = 0.25 \]
summary and discussion
1. multiplier $> 1$ is not necessary for stimulus
   - stimulus requires unemployment multiplier $> 0$ (as in data)

2. bang-for-the-buck logic does not hold
   - same stimulus for $m = 0.1$ and $m = 1.4$

3. completely filling the unemployment gap is not optimal
   - optimal to partially fill unemployment gap
   - except if public services = private services

4. low marginal social value of $g$ does not imply no stimulus
   - optimal to reduce unemployment gap
   - except if public services = digging holes
distortionary taxes do not imply smaller stimulus

- with distortionary taxation, formula remains valid
  - but Samuelson spending is lower
- however, the output multiplier is not useful anymore
  - \( dy/dg = m + \text{labor-supply response to taxes} \)
  - labor-supply distortion reduces \( dy/dg \) but not \( m \)
  - so \( m > dy/dg \), and possibly \( dy/dg < 0 \) while \( m > 0 \)

5. distortionary taxation does not imply smaller stimulus
- only average public spending is lower