Nash Equilibria in Models of Fiscal Competition with Unemployment

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Introduction: Research question

- Fiscal competition
  - widely observed between countries and regions
  - recognized as representing “**race to bottom**”

- The purpose of fiscal competition
  - The government is competing not only to **encourage investment** but also to **create employment**

- Policy variable
  - However taxes aren't the only policy instrument the government can compete in the realistic world
  - Countries/regions are facing intergovernmental competition for using other policy variable

Introduction: Research question

➢ **Research question**

- What policy variable should be implemented by the government under fiscal competition environment where unemployment exists?

➢ **Summary of results**

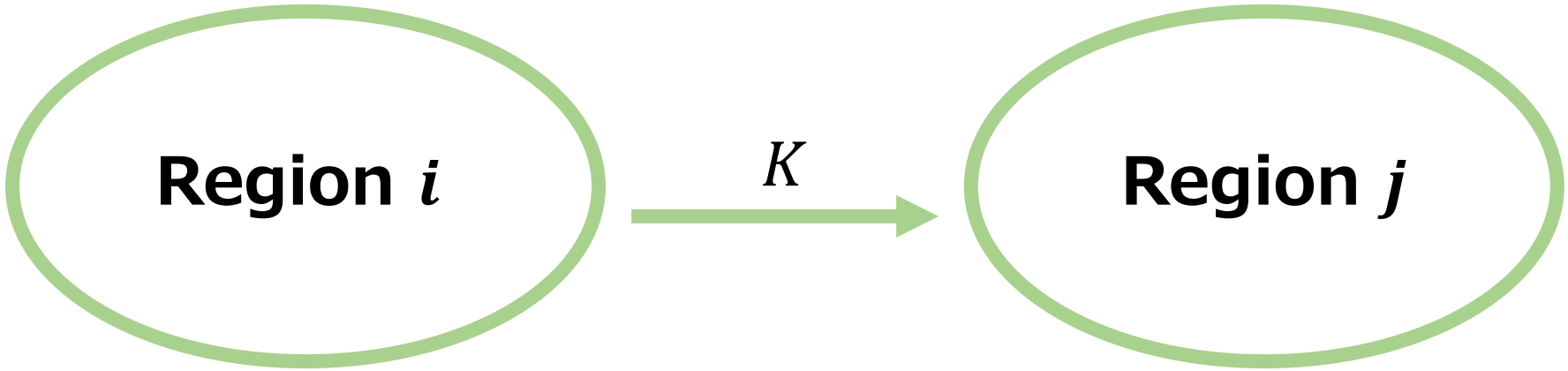
In some cases,

- tax rates under tax competition are likely to be more competitive than under expenditure
- governments prefer to choose government expenditure as their strategic variable rather than tax rates

Model: Basic settings

- N regions: $N \geq 2$
  - The population in each region is unity
  - Capital input: K_i (mobile), Labor input: L_i (immobile), Land input: $\overline{H_i}$ (immobile, given)
  - Capital market: $\sum_{i=1}^{N} K_i = \overline{K}$
- Two goods: X_i (private goods) and G_i (public goods)
  - Private goods: CRS production function: $F(\overline{H_i}, K_i, L_i)$ perfect competitive markets
  - Public goods: $t_i K_i = G_i$ (t_i: tax rate)
- Social welfare function: $U_i(X_i, G_i) = X_i + v(G_i)$

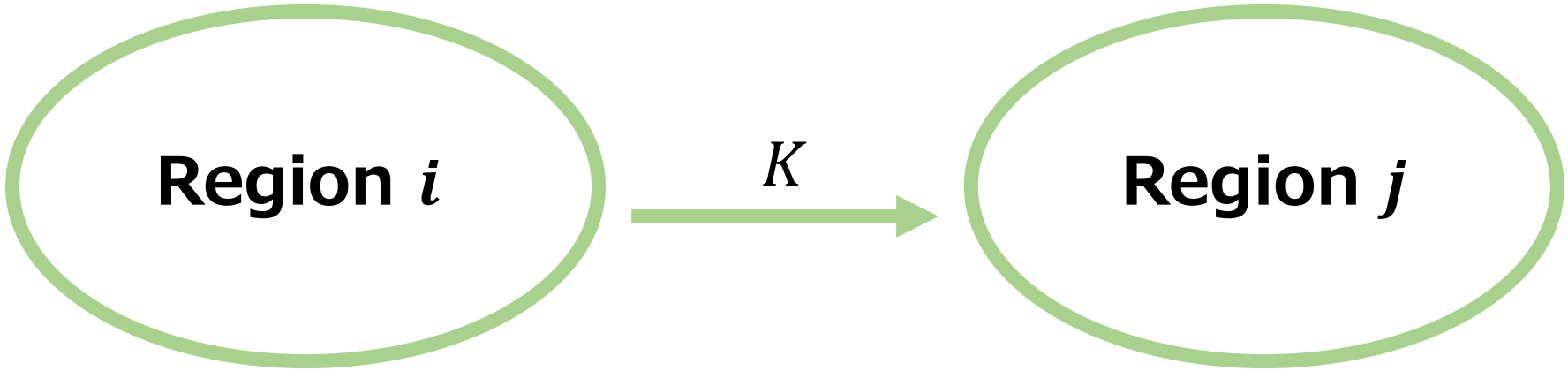
Model: Unemployment



- $t_i \uparrow$

- $K_j \uparrow$: fiscal externality (positive)
- $K_j \uparrow \Rightarrow L_j$?: employment externality (positive or negative?)

Model: Policy variable



- $t_i \uparrow$
  (tax competition)

- $K_j \uparrow \Rightarrow G_j \uparrow$
  $\because t_j$ is given: $\bar{t}_j K_j = G_j$

- $G_i \uparrow (t_i \uparrow)$
  (expenditure competition)

- $K_j \uparrow \Rightarrow t_j \downarrow (\Rightarrow K_j \uparrow\uparrow)$
  : strategic effect (positive)
  $\because G_j$ is given: $t_j K_j = \bar{G}_j$

Tax vs expenditure competition

- Investigating whether tax rate and expenditure level are less than optimal

Proposition:

① $t^o > t^* > t^\star, U^o > U^* > U^\star$

② $t^o < t^* < t^\star, U^o > U^* > U^\star$

($*$: tax competition, $\star$: expenditure competition)

Tax vs expenditure competition

- The interpretation of Proposition is as follows

- Three effect in the economy
  - Fiscal external effect (positive)
  - Employment external effect (**positive** or **negative**)
  - Strategic effect in expenditure competition case (positive)

Tax vs expenditure competition

The interpretation of Proposition:

- Employment externality is **positive** or **not too negative**
  - "All effects is positive" or "fiscal external effect and strategic effect dominate employment external effect"
    ⇨ Public goods is under-provided (Proposition ① $t^o > t^* > t^\star$)
- Employment externality is **negative**
  - Employment external effect dominates fiscal external effect and strategic effect
    ⇨ Public goods is over-provided (Proposition ② $t^o < t^* < t^\star$)