Lobbying and Tax Competition in an Oligopolistic Industry: A Reverse Home Market Effect

Former title: Lobbying and Tax Competition in an Agglomeration Economy: A Reverse Home Market Effect

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Remark: Notations are slightly different from those in the final version published in Spatial Economic Analysis.
Small countries have a low corporate tax rate

Country size and corporate tax rate of OECD countries in 2011.
Some small countries with low corporate tax rates have succeeded in attracting foreign investment.

- **Ireland**, (tax rate) = 12.5%:
  Hosting multinational firms of ICT and pharmaceutical industry from the U.S.

- **Singapore**, (tax rate) = 17%:
  Hub for multinational firms entering Asian market.
The foreign investment to these countries is mainly export-oriented.

- Ireland: foreign-owned firms accounted for 91% of Ireland’s tradeable exports in 2009.
- Singapore: long tradition of export-oriented industrialization.
Q. Why can some small-sized countries attract export-oriented investment by setting a low tax rate?

- This study tackles the question by examining tax competition b/w politically-interested governments in an economy with agglomeration forces.
Setting

- Tax competition b/w two countries of different size in a footloose capital version of NEG model.
- Capital owners as a SIG make political contributions.
- Governments’ objective:
  \[ a \times (\text{residents’ welfare}) + (\text{political contributions}) \]
Main result

- If the governments heavily care about political contributions and trade costs are low,
  the small country attracts a more than proportionate share of firms
  (reversal of the home-market effect).
Mechanism

- (Firm’s profit) = (Local profit) + (Export profit).
- Because of the presence of trade costs and international oligopoly,
  - For firms in the **small country**: (Local profit) < (Export profit).
  - For firms in the **large country**: (Local profit) > (Export profit).

→ Both firms prefer **fewer rivals** in the **large country**.
→ Owners of firms lobby to attain such an industry allocation.
→ As a result, the **small country** may **import capital** from the large country by setting a **lower tax rate**.
Related literature

- Tax competition in public finance: *Small* country attracts capital.

- Tax competition in NEG: *Large* country attracts capital.
  - Ludema and Wooton (2000); Baldwin and Krugman (2004); Ottaviano and van Ypersele (2005); Haufler and Wooton (2010).

- Protection for sale:
Two countries: 1 and 2.

Two factors: Internationally mobile capital $K$ and immobile labor $L$.

$$(L_1, K_1) = (sL, sK), \quad (L_2, K_2) = ((1 - s)L, (1 - s)K).$$

Assume country 1 is small: $s < 1/2$.

Two industries:

- Non-numéraire-homogeneous good (=modern sector)
  
  *Cournot* competition, trade costs.

- Numéraire-homogeneous good (=traditional sector)
  
  Perfect competition, no trade costs.
From the quadratic utility function, we get linear demands:

\[ p_1 = 1 - \frac{Q_1}{L_1} = 1 - \frac{Q_1}{(sL)}, \]
\[ p_2 = 1 - \frac{Q_2}{L_2} = 1 - \frac{Q_2}{(1 - s)L}. \]

The slope of the demand curve in country 1 is steeper than that of 2, while the intercepts are identical.

→ The market in 1 is more competitive.
For firms located in country 1:

\[ \pi_1 \equiv p_1 q_{11} + (p_2 - \tau) q_{12}. \]

For firms located in country 2:

\[ \pi_2 \equiv (p_1 - \tau) q_{21} + p_2 q_{22}. \]

Firms need one unit of \( K \) to start operation.

In location equilibrium,

\[ \pi_1(\lambda_1) = \pi_2(\lambda_2 \equiv 1 - \lambda_1). \]
The equilibrium share of firms when $s$ is small ($s < 1/2$):

$$\pi_1(\lambda_1) = \pi_2(\lambda_1),$$

$$\therefore \tilde{\lambda}_1 = s - \frac{(1 - 2s)[2 - \tau(K + 1)]}{2\tau K} < s.$$ 

Note that $K_1 = sK$.

Lemma (Home-market effect)

The small country obtains a less than proportionate share of firms.

Intuition: Suppose $\lambda = 1/2 \rightarrow p_1 < p_2 \rightarrow \pi_1(1/2) < \pi_2(1/2) \rightarrow \lambda_1 \downarrow.$
Tax competition

- Lump sum tax/subsidy $T_i$ on each firm operating in $i$.
- After-tax profits are equalized:
  \[
  \pi_1 - T_1 = \pi_2 - T_2,
  \]
  \[
  \Leftrightarrow \lambda_1 = \tilde{\lambda}_1 - \frac{K + 1}{2T^2KL}(T_1 - T_2).
  \]
- Tax revenues are redistributed to residents.
We model lobbying as in “Protection for sale” by Grossman and Helpman (1994, 1995).

1. Capital owners as a lobbying group make contributions to their domestic government.
2. Tax rates are non-cooperatively determined by governments.
3. Firm relocation occurs.
Welfare of workers and capital owners in $i$ (up to constants) is

$$W_i^l = CS_i + TR_i = (1 - p_i)^2 L_i / 2 + T_i \lambda_i K,$$

$$W_i^c = \Pi_i = (\pi_i - T_i) K_i.$$

By focusing on the “truthful equilibria”, we can rewrite the government’ objective as

$$G_i = a(W_i^l + W_i^c) + C_i$$

$$= aW_i^l + (1 + a)W_i^c \quad (\because C_i = W_i^c - \bar{B},$$

$$= a(CS_i + TR_i + \beta \Pi_i) \quad (\because \beta \equiv (1 + a)/a.$$

$a$: weight on aggregate welfare, $C_i$: contribution.
Benchmark 1: No lobbying, symmetric size

- Under the benevolent governments, we set $a = 1$:

$$G_i = CS_i + TR_i + \Pi_i.$$

- Equilibrium tax rates are the solution of $dG_i/dT_i = 0$ for all $i \in \{1, 2\}$.

- When two countries are symmetric ($s = 1/2$),

$$T_1^n = T_2^n = \frac{4\tau KL}{K + 1} \left[ \tau - \frac{2 - \tau}{2} - \frac{2 - \tau}{4(K + 1)} \right]$$

- Tax-revenue effect: positive.

- Profit-income effect: negative.

- Consumer-price effect: negative.

$\rightarrow \lambda^n_1 = 1/2.$
Benchmark 2: No lobbying, asymmetric size

- When two countries are asymmetric ($s < 1/2$),

$$T_1^n = \frac{4\tau KL}{K + 1} \left[ \tau - \frac{\tau}{2} - \frac{2 - \tau}{4(K + 1)} \right] - \frac{\tau L(1 - 2s)\Theta_1^n}{4(K + 1)^2(4K + 5)},$$

$$T_2^n = \frac{4\tau KL}{K + 1} \left[ \tau - \frac{\tau}{2} - \frac{2 - \tau}{4(K + 1)} \right] + \frac{\tau L(1 - 2s)\Theta_2^n}{4(K + 1)^2(4K + 5)}.$$

- **Market-size effect** modifies the first three effects.

- Since firms relocate to large country 2 to save transport costs, government 2 can exploit agglomeration rents: $T_1^n < T_2^n$.

- Country 1 still exports capital despite its lower tax rate: $\lambda_1^n < s$. 

18 / 31
In the interior equilibrium, we have

**Proposition 1**

*The small country hosts a smaller share of firms than its capital share and sets a lower tax rate than the large country.*

The home-market effect still prevails.
The governments’ objective function:

\[
\frac{1}{a} G_i = CS_i + TR_i + \beta \Pi_i.
\]

The impact on profit income is

\[
\frac{d\Pi_i}{dT_i} = \frac{d(\pi_i - T_i)K_i}{dT_i} = \left( \frac{\partial \pi_i}{\partial \lambda_i} \frac{d\lambda_i}{dT_i} - 1 \right)K_i
\]

Large country 2, \( \partial \pi_2 / \partial \lambda_2 < 0 \) (\( \therefore \lambda_2 \uparrow \rightarrow \pi_D \downarrow \downarrow, \pi_{EX} \uparrow \))

Small country 1, \( \partial \pi_1 / \partial \lambda_1 > 0 \) when trade costs are low.

\( \therefore \lambda_1 \uparrow \rightarrow \pi_D \downarrow, \pi_{EX} \uparrow \uparrow \)

\[ d\Pi_1 / dT_1 < d\Pi_2 / dT_2 \rightarrow \text{Gov.1 is more eager to cut taxes: } T_1 << T_2. \]
Firms prefer $\lambda_1 = 1$. 

Profits of a firm in the small country
Profits of a firm in the large country

Firms prefer $\lambda_2 = 0$ or $\lambda_1 = 1$. 
Home market effect may be reversed

- Equilibrium tax rates:

\[
T_1^* = \frac{4\tau KL}{K + 1} \left[ \tau - \frac{\beta \tau}{2} - \frac{2 - \tau}{4(K + 1)} \right] - \frac{\tau L(1 - 2s)\Theta_1^*}{4(K + 1)^2[2(3 - \beta)K + 5]},
\]

\[
T_2^* = \frac{4\tau KL}{K + 1} \left[ \tau - \frac{\beta \tau}{2} - \frac{2 - \tau}{4(K + 1)} \right] + \frac{\tau L(1 - 2s)\Theta_2^*}{4(K + 1)^2[2(3 - \beta)K + 5]}
\]

\[\rightarrow T_1^* < T_2^*.\]

- The equilibrium share of firms:

\[
\lambda^* = s - \frac{(1 - 2s)[K + 2 - \tau(K + 1)^2 - 2(\beta - 1)K\{1 - \tau(K + 1)\}]}{\tau K [2(3 - \beta)K + 5]}.\]

- If \(\beta\) is large enough (\(\beta^* < \beta\)) and trade costs are low enough (\(\tau < \tau^*\)), then \(\lambda^* > s\).
Home market effect may be reversed

In the interior equilibrium, we have

**Proposition 2 (Reverse HME)**

*If governments care about contributions heavily ($\beta > \beta^*$) and trade costs are low ($\tau < \tau^*$), the small country obtains a more than proportionate share of firms.*
If \( \tau < \tau^* \) hold, we have \( d|T_1^* - T_2^*|/d\beta > 0 \).
If $\tau < \tau^*$ hold, we have $d\lambda_1/d\beta > 0$. 
Welfare implications

\[ \lambda_1^o = \text{argmax} \ W, \quad W \equiv W_1 + W_2. \]

**Proposition 3**

When the RHME prevails, the equilibrium share under the biased-gov.s is more socially inefficient than that under the benevolent gov.s.
Extensions: Asymmetric weight

- Consider asymmetric weights: $\beta_1 \neq \beta_2$.
- The government with a higher weight decreases its tax rate more.
- RHME still emerges.
Remark

Empirical studies suggest the political weight $\beta$ is small, which is inconsistent with the predictions.

→ Not every studies report small estimates. See Mitra et al. (2006).
→ Past empirical studies are based on trade policies, not on tax policies.

Summary

- Capital owners in both countries seek a fewer number of firms in the large market.
- The small country lowers its tax rate excessively because of lobbying pressure by capital owners.
  → The reversal of the home market effect.
Thank you for your attention!
Small countries attract foreign capital

Country size and \((\text{Inward FDI stock})/(\text{GDP})\) of OECD countries in 2011.

![Graph showing the correlation between country size and inward FDI stock relative to GDP for OECD countries, with a correlation coefficient of -0.554. The graph includes data points for various countries such as Luxemburg (LUX), Ireland (IRL), and the United States (USA).]


