STRATEGIC TRADE POLICY
AND
MANAGERIAL DELEGATION
IN A MIXED DUOPOLY

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Background

• Tariff Protection Policy under Duopoly
    ---- Rent-Shifting Effect

• Separation of Ownership and Management
    ---- Deviation From Profit Maximization

• Semipublic Firm in a Mixed Oligopoly
    ---- a weighed sum of firm profit and home social welfare
**Motivation (1)**

- Examine and Compare the Eq. Results in the Three Cases:
  - Case **N**: No Managerial Delegation
    - ex. Chao and Yu (2006)
  - Case **G**: Government Moves First
  - Case **O**: Owners Move First

- Effect of Partial Privatization

  - Managerial Delegation
  - Trade Policy
Motivation (2)

- Separation of Ownership and Management
- Mixed Duopoly
- Import Tariff Policy

- How the Alternative Move Orders Affect Gov. and Owners’
  - Strategic Decisions: Tax or Subsidy?
  - Mutual Effect: Substitute of Complement?
  - Payoffs
Main Results

• Presence of Separation of Ownership and Management
  • Strengthens (Weakens) Gov’s Tariff Incentive
    When the Degree of Nationalization is Low (High).

• When Owners Move First (vs. When Gov. Moves First)
  • Tariff Policy substitute Managerial Delegation
  • Foreign Product↓, Higher Home Profit↑, Home Welfare↓

• Acting as the First Mover(s) always yield a Higher Payoff
## Related Papers

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Case N (Chao & Yu(2006))

Assume:

\[ C_F^0 \leq C_H^0 \]
Firms’ Objective Function

Firm’s Profit Function:
\[ \pi_i(q, c_i) = (P(Q) - c_i)q_i \]

Home Country’s Welfare Function:
\[ W_H(q, t) = CS(Q) + \pi_H(q, c_H) + tq_F \]

Home Semipublic Firm’s Objective Function:
\[ U_H(q, t; k) = kW_H(q, t) + (1 - k)\pi_H(q, c_H) \quad (k \in [0,1]) \]

Foreign Private Firm’s Objective Function:
\[ \pi_F(q, c_F) = (P(Q) - c_F)q_F \]
Output Decision

Foreign Firm’s Output

Home Firm’s Reaction Function

Foreign Firm’s Output

Home Firm’s Reaction Function

Home Firm’s Product

Foreign Firm’s Product

$E$
Gov’s Optimal Import Tariff

Tariff Incentives for Welfare Maximization:

\[ 0 = \frac{\partial W_H}{\partial t} = q_F \left( \frac{\partial P}{\partial t} - 1 \right) + \left( P - c_H \right) \frac{\partial q_H}{\partial t} + t \frac{\partial q_F}{\partial t} \]

Terms of Trade Effect
Resource Allocation Effect
Tariff Revenue Effect

Optimal Tariff: \( t^N > 0 \)
Case G (Chang(2007))

1st stage
Home Government

2nd stage
Home Semipublic Firm
Owner
Manager

3rd stage
Home Market

Contract
Foreign Firm
Owner
Manager

output
tariff
Manager’s Incentive Contract Function:

\[ M_i = \beta_i \pi_i + (1 - \beta_i)P \cdot q_i = \left( P - \beta_i c_i \right) q_i \quad (\beta_i \in [0,1]) \]

Define \( \sigma_i = (1 - \beta_i) c_i \)

as Owner’s Subsidy Equivalent

\[ M_i = \left( P - c_i + \sigma_i \right) q_i \]

as if Owner Subsidizes the Firm

When \( \sigma_i > 0 \)

Firms Behave More Aggressively when Privatized
2nd Stage: Owners’ Delegation Decision (1)

FOC for Home Firm’s Payoff Maximization:

\[
\left( \frac{\partial U_H}{\partial q_H} + \frac{\partial U_H}{\partial q_F} \Gamma_q^F \right) \frac{\partial q_H}{\partial \sigma_H} = 0
\]

FOC for Foreign Firm’s Profit Maximization:

\[
\left( \frac{\partial \pi_F}{\partial q_F} + \frac{\partial \pi_F}{\partial q_H} \Gamma_q^H \right) \frac{\partial q_F}{\partial \sigma_F} = 0
\]

FOC as a Stackelberg Leader

• Effects of Managerial Delegation
  • When k=0: Prisoner’s Dilemma ---Basu(1995)
2nd Stage: Owners’ Delegation Decision (2)

FOC for Home Firm’s Payoff Maximization:

\[
\left( \frac{\partial U_H}{\partial q_H} + \frac{\partial U_H}{\partial q_F} \Gamma^F_q \right) \frac{\partial q_H}{\partial \sigma_H} = 0
\]

FOC for Foreign Firm’s Profit Maximization:

\[
\left( \frac{\partial \pi_F}{\partial q_F} + \frac{\partial \pi_F}{\partial q_H} \Gamma^H_q \right) \frac{\partial q_F}{\partial \sigma_F} = 0
\]

\[ k \uparrow \quad \rightarrow \quad \text{Home Owner’s Subsidy Equivalent} \uparrow \]

\[ \text{Foreign Owner’s Subsidy Equivalent} \downarrow \]
2nd Stage: Owners’ Delegation Decision (2)

Foreign Owner’s Subsidy Equivalent

Home Owner’s Reaction Function

\[
\frac{\partial \sigma^e_H}{\partial t} > 0 \text{ dependent on } k
\]

\[
\frac{\partial \sigma^e_F}{\partial t} > 0, \frac{\partial \sigma^e_H}{\partial k} > 0, \frac{\partial \sigma^e_F}{\partial k} < 0
\]
1st Stage: Gov’s Tariff Decision

Tariff Incentives for Welfare Maximization:

Terms of Trade Effect + Resource Allocation Effect + Tariff Revenue Effect

- Weakened in Delegation when k is small
- Strengthened in Delegation when k is large

\[ k \uparrow \quad t^G \downarrow \quad \text{When } k \text{ is small} \]
\[ t^G \uparrow \quad \text{When } k \text{ is large} \]
Case O: Owners Move First

1st stage

Home Semipublic Firm

Owner

Manager

Home Government

Contract

2nd stage

Foreign Firm

Owner

Manager

3rd stage

tariff

output

Home Market
2nd Stage: Gov’s Tariff Decision

Optimal Tariff Decision:

\[ \sigma^e_H \uparrow \quad t \downarrow \quad \sigma^e_F \uparrow \quad t \uparrow \]

- When Government Moves First (Case G)
  
  Complement if \( k < \frac{1}{3} \)

  Tariff Policy \( \leftrightarrow \) Managerial Delegation

  Substitute if \( k > \frac{1}{3} \)

- When Owners Move First (Case O)

  Tariff Policy \( \leftrightarrow \) Managerial Delegation

  Substitute
1st Stage: Owners’ Delegation Decision

FOC for Home Firm:

\[ 0 = \frac{\partial U^e_H}{\partial \sigma_H} \left( \frac{\partial U_H}{\partial q^e_H} + \frac{\partial q_F}{\partial q_H} \frac{\partial U_H}{\partial \sigma_H} \frac{\partial t^e}{\partial \sigma_H} \right) \]

- Excess Competition Effect
- Rent Shifting Effect
- Tariff Imposition Effect

\[ \sigma^o_H > 0 \]

FOC for Foreign Firm:

\[ 0 = \frac{\partial \pi^e_F}{\partial \sigma_F} \left( \frac{\partial \pi_F}{\partial q^e_F} + \frac{\partial q_H}{\partial q_F} \frac{\partial \pi_F}{\partial \sigma_F} \right) \]

\[ \sigma^o_F < 0 \]
Summary(1): Import Tariff

$A(k)$, $C(k)$, $B(k)$

$t^O > t^N > t^G$

$t^G > t^O > t^N$

$t^N > t^O > t^G$
Summary(2): Owner’s Subsidy Equivalent

\[ \sigma_H^G < \sigma_H^O \]

\[ \sigma_H^G > \sigma_H^O \]
Summary(3): Home Output

\[ q_H^O > q_H^N > q_H^G \]
\[ q_H^N > q_H^O > q_H^G \]
Summary(4): Foreign Output

\[ q_F^G > q_F^O > q_F^N \]

\[ q_F^N > q_F^O > q_F^G \]
Summary(5): Home Profit

\[ \pi_H \]

\[ \pi_H^O \]

\[ \pi_H^N \]

\[ \pi_H^G \]
Summary(6): Foreign Profit

The diagram illustrates the foreign profit functions $\pi_F$, $\pi^N_F$, $\pi^O_F$, and $\pi^G_F$ in relation to the variable $k$. The graph shows the points where these functions intersect, with a notable point at $k = 0.34$. The values of $\pi_F$ range from $0.012$ to $0.001$ as $k$ changes from $0$ to $1$. The functions are labeled and the axes are clearly marked.
Summary(7): Home Welfare

The diagram illustrates the relationship between welfare measures $W_H^G$, $W_H^O$, and $W_H^N$ as a function of $k$. The axes are labeled with $W_H$ on the y-axis and $k$ on the x-axis. The curves show how each measure changes with different values of $k$. The diagram helps in understanding how different welfare indicators respond to changes in $k$. The specific values and implications would require further analysis of the underlying data and context.
Some Other Results

• Foreign Owner’s Subsidization Incentive is Dependent on the Move Orders

• For Home Owner
  \[ \pi^O_H > \pi^N_H > \pi^G_H \] independent of k

• For Foreign Owner
  Managerial Delegation always yields Lower Profit

• For Home Government
  First Mover Payoff is Much Larger than others