

STRATEGIC TRADE POLICY AND MANAGERIAL DELEGATION IN A MIXED DUOPOLY

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Background

- **Tariff Protection Policy under Duopoly**
 - cf. Brander-Spencer (1984)
 - Rent-Shifting Effect
- **Separation of Ownership and Management**
 - cf. Fershtman and Judd(1987), Sklivas (1987)
 - Deviation From Profit Maximization
- **Semipublic Firm in a Mixed Oligopoly**
 - cf. Matsumura (1998)
 - 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)

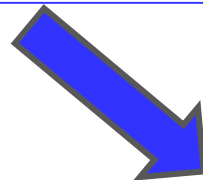
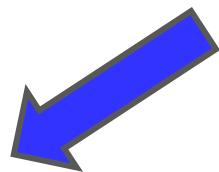
- Case G: Government Moves First**

- ex. Chang(2007)

- Case O: Owners Move First**

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Effect of Partial Privatization

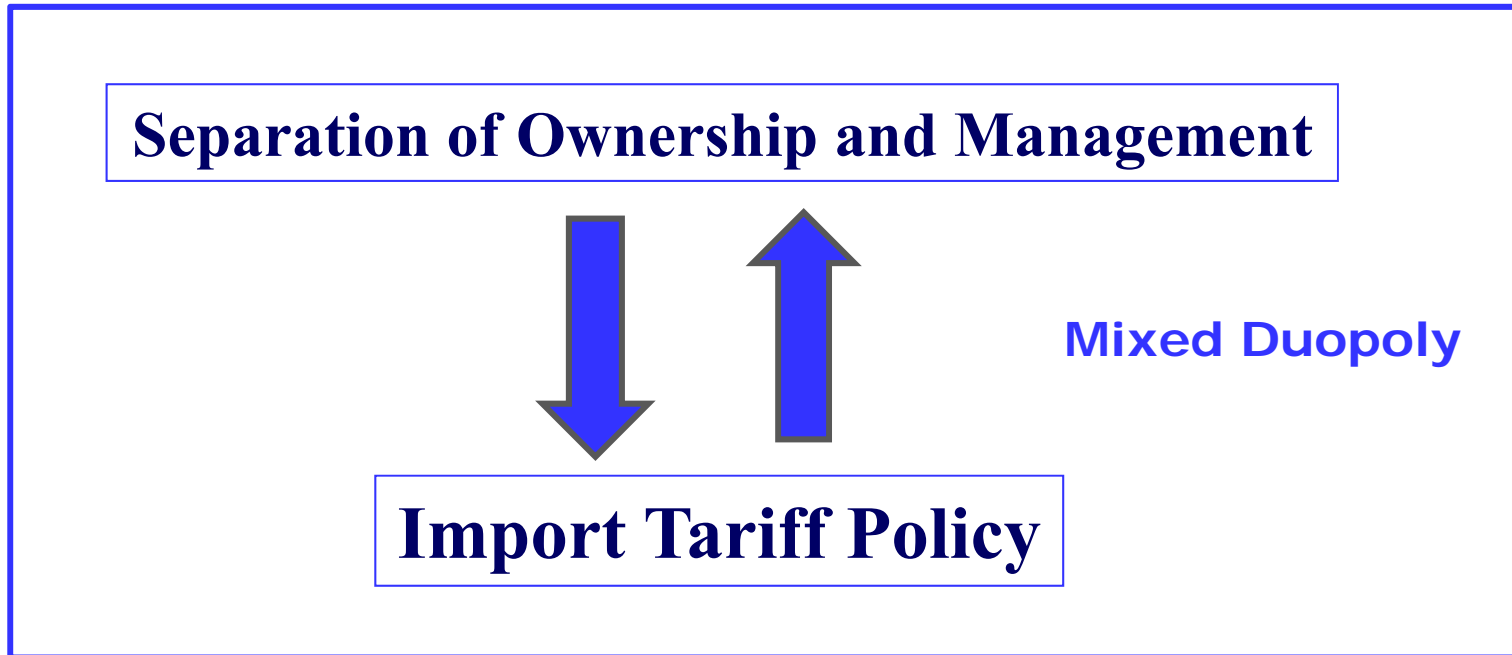


Managerial Delegation

Trade Policy

Motivation (2)

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- **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**  **Managerial Delegation**

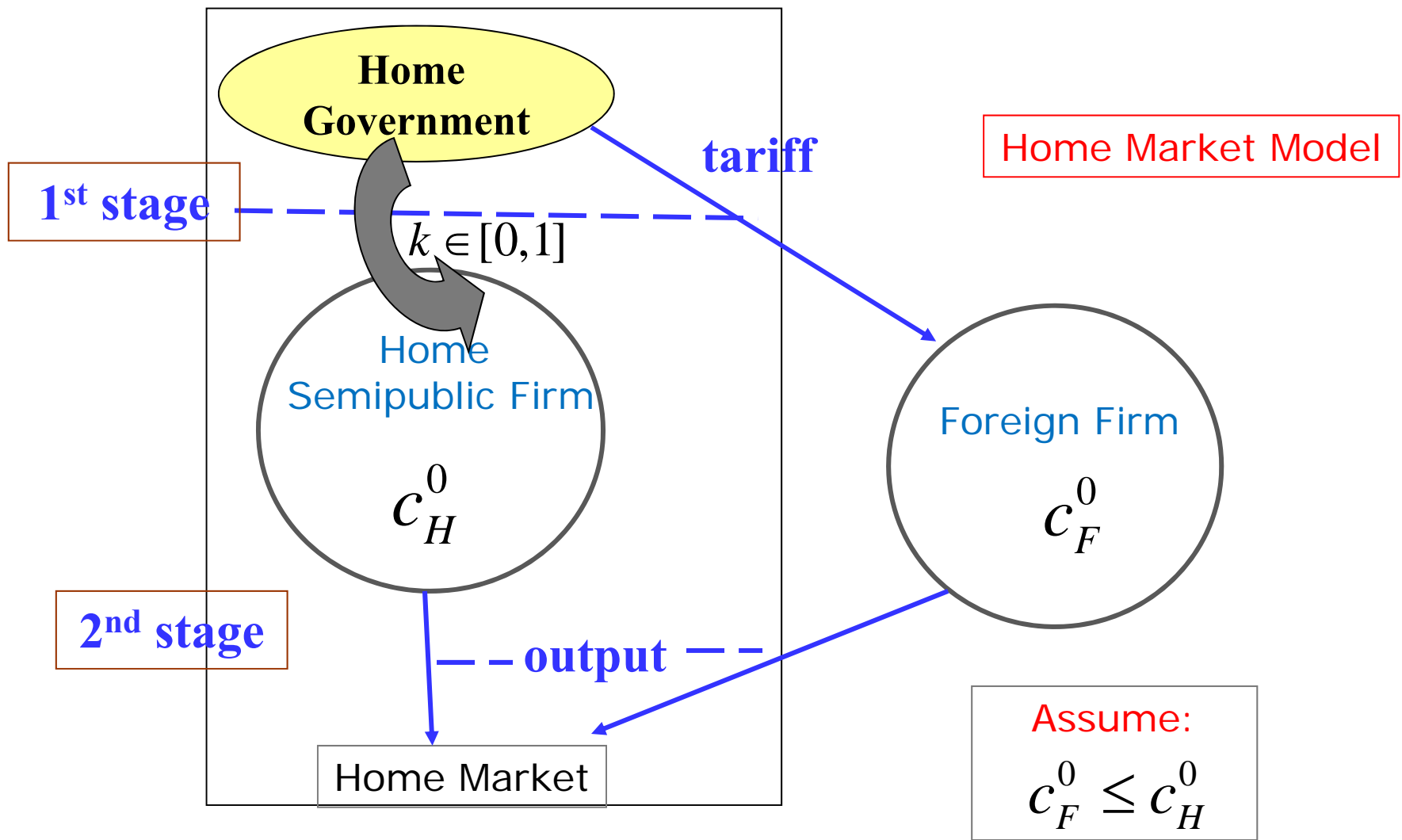
- **Foreign Product↓, Higher Home Profit↑, Home Welfare↓**

- **Acting as the First Mover(s) always yield a Higher Payoff**

Related Papers

	Import Tariff	Managerial Delegation	Mixed Oligopoly
Brander and Spencer(1984)			
Fershtman &Judd(1987), Sklivas(1987)			
Matsumura(1998)			
Das(1997)			
Chen and Yu(2006)			
Barros(1995) White(2001)			
Chang(2007)			

Case N (Chao&Yu(2006))



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:

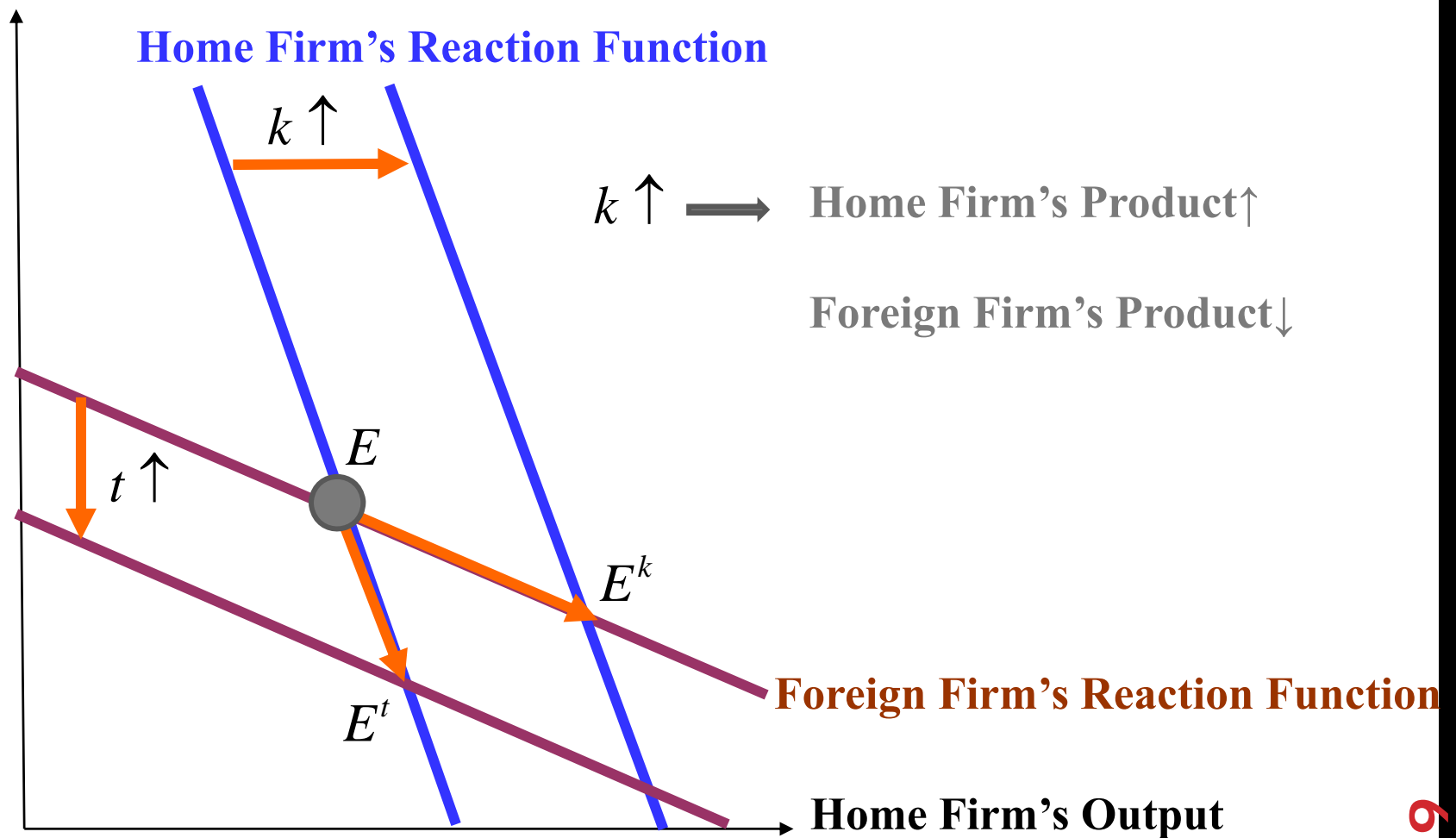
$$U_H(q, t; k) = kW_H(q, t) + (1 - k)\pi_H(q, c_H) \quad (k \in [0, 1])$$

Foreign Private Firm's Objective Function:

$$\pi_F(q, c_F) = (P(Q) - c_F)q_F$$

Output Decision

Foreign Firm's Output



Gov's Optimal Import Tariff

Tariff Incentives for Welfare Maximization:

$$0 = \frac{\partial W_H}{\partial t} = \underbrace{-q_F \left(\frac{\partial P}{\partial t} - 1 \right)}_{\text{Terms of Trade Effect}} + \underbrace{(P - c_H) \frac{\partial q_H}{\partial t}}_{\text{Resource Allocation Effect}} + \underbrace{t \frac{\partial q_F}{\partial t}}_{\text{Tariff Revenue Effect}}$$

Terms of Trade Effect

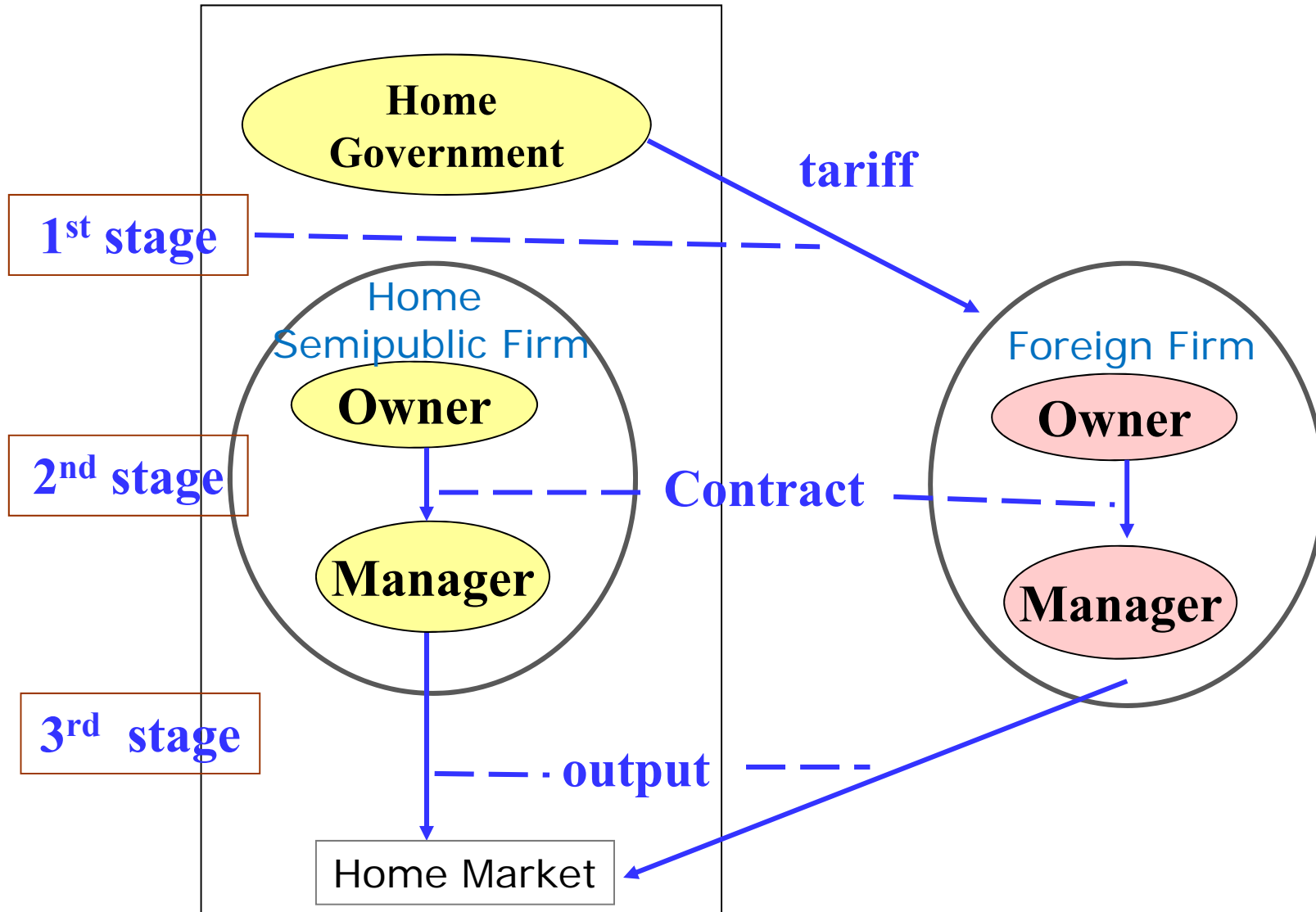
Resource Allocation Effect

Tariff Revenue Effect

Optimal Tariff: $t^N > 0$



Case G (Chang(2007))



3rd Stage: Managers' Output Decision

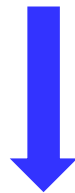
Manager's Incentive Contract Function:

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



Define $\sigma_i = (1 - \beta_i) c_i$
as **Owner's Subsidy Equivalent**

$$M_i = (P - c_i + \sigma_i) q_i$$



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:

$$\left(\begin{array}{c} \frac{\partial U_H}{\partial q_H} + \frac{\partial U_H}{\partial q_F} \Gamma^F_q \\ \frac{\partial U_H}{\partial q_H} \end{array} \right) \frac{\partial q_H}{\partial \sigma_H} = 0$$

FOC for Foreign Firm's Profit Maximization:

$$\left(\begin{array}{c} \frac{\partial \pi_F}{\partial q_F} + \frac{\partial \pi_F}{\partial q_H} \Gamma^H_q \\ \frac{\partial \pi_F}{\partial q_F} \end{array} \right) \frac{\partial q_F}{\partial \sigma_F} = 0$$

FOC as a Stackelberg Leader

- **Effects of Managerial Delegation**

- When $k=0$: Prisoner's Dilemma ---Basu(1995)
- When $k=1$: Higher Welfare---Barros(1995)

2nd Stage: Owners' Delegation Decision (2)

FOC for Home Firm's Payoff Maximization:

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

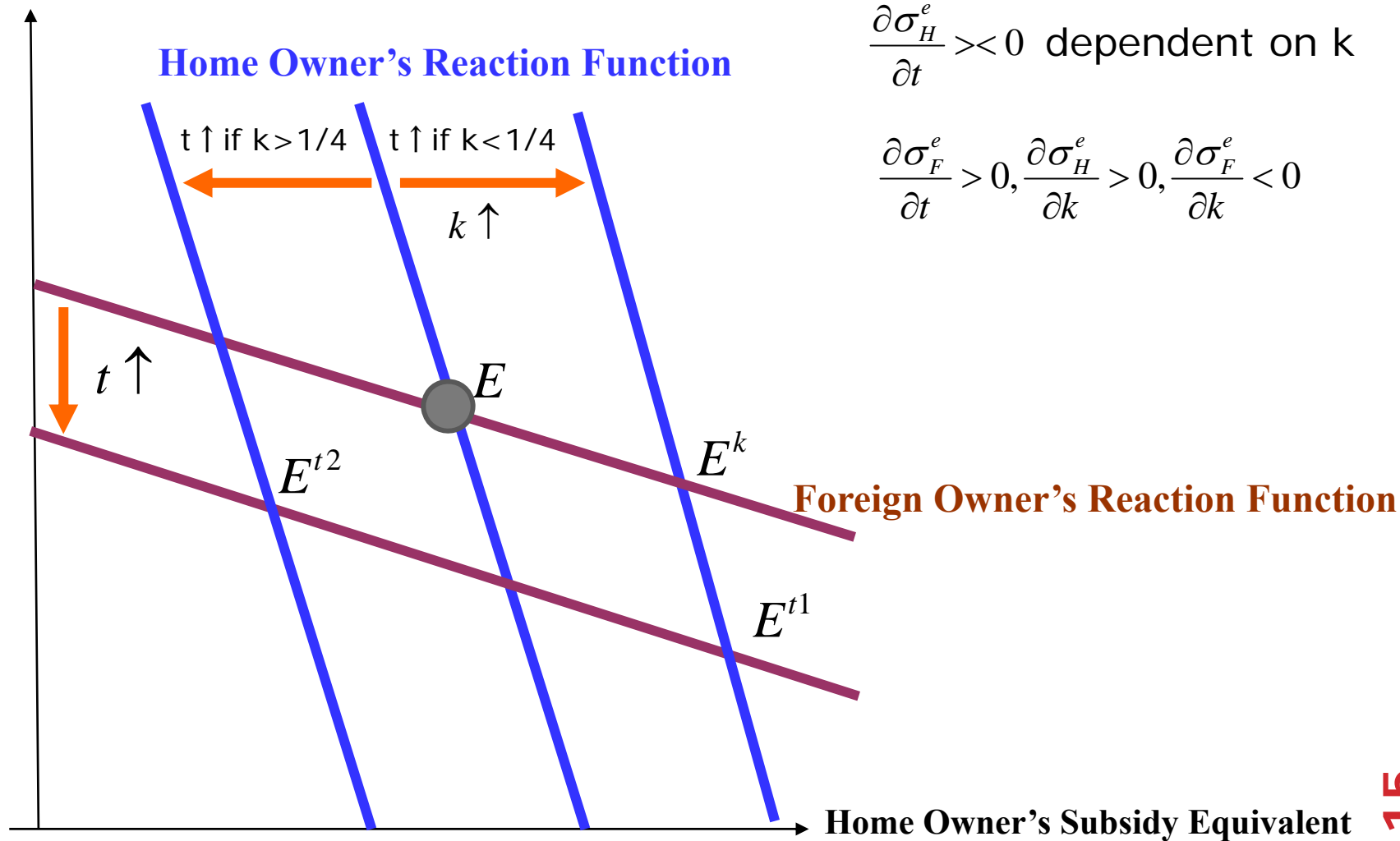
FOC for Foreign Firm's Profit Maximization:

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

$k \uparrow \longrightarrow$ Home Owner's Subsidy Equivalent \uparrow
Foreign Owner's Subsidy Equivalent \downarrow

2nd Stage: Owners' Delegation Decision (2)

Foreign Owner's Subsidy Equivalent

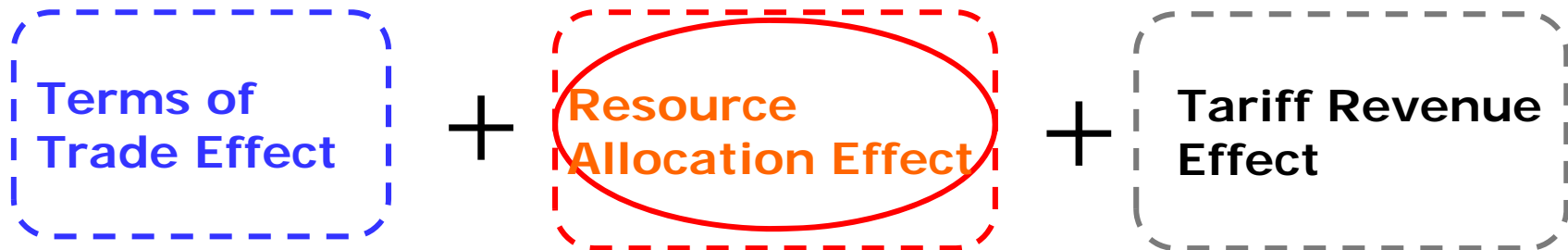


$$\frac{\partial \sigma_H^e}{\partial t} > < 0 \text{ dependent on } k$$

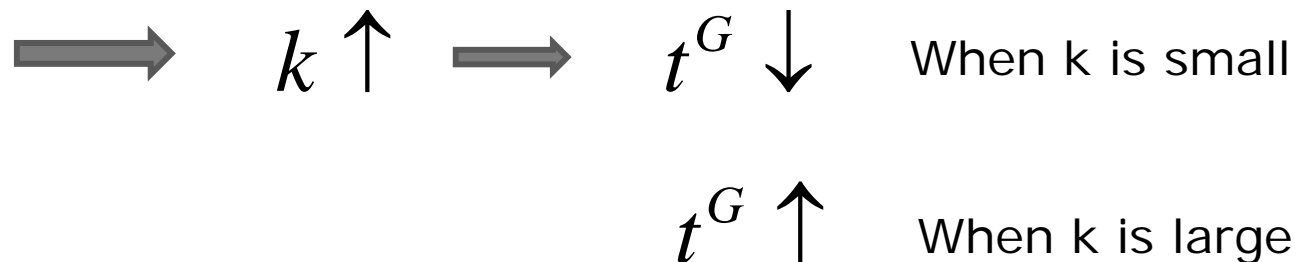
$$\frac{\partial \sigma_F^e}{\partial t} > 0, \frac{\partial \sigma_H^e}{\partial k} > 0, \frac{\partial \sigma_F^e}{\partial k} < 0$$

1st Stage: Gov's Tariff Decision

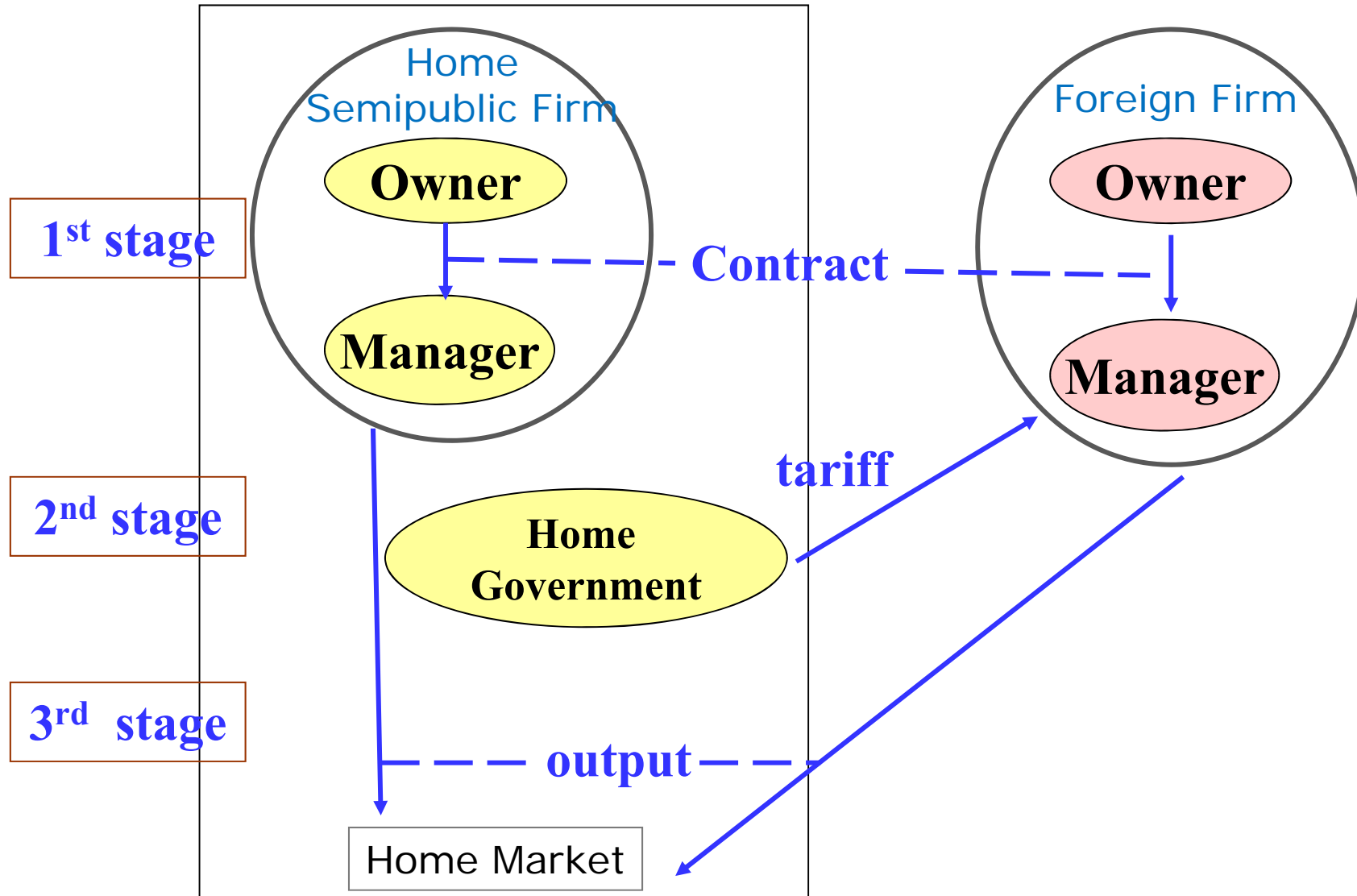
Tariff Incentives for Welfare Maximization:



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



Case 0: Owners Move First



2nd Stage: Gov's Tariff Decision

Optimal Tariff Decision:

$$\sigma_H^e \uparrow \longrightarrow t \downarrow$$

$$\sigma_F^e \uparrow \longrightarrow t \uparrow$$

- When Government Moves First (Case G)

Tariff Policy $\xleftrightarrow[\text{Substitute if } k > 1/3]{\text{Complement if } k < 1/3}$ Managerial Delegation

- When Owners Move First (Case O)

Tariff Policy $\xleftrightarrow{\text{Substitute}}$ Managerial Delegation

1st Stage: Owners' Delegation Decision

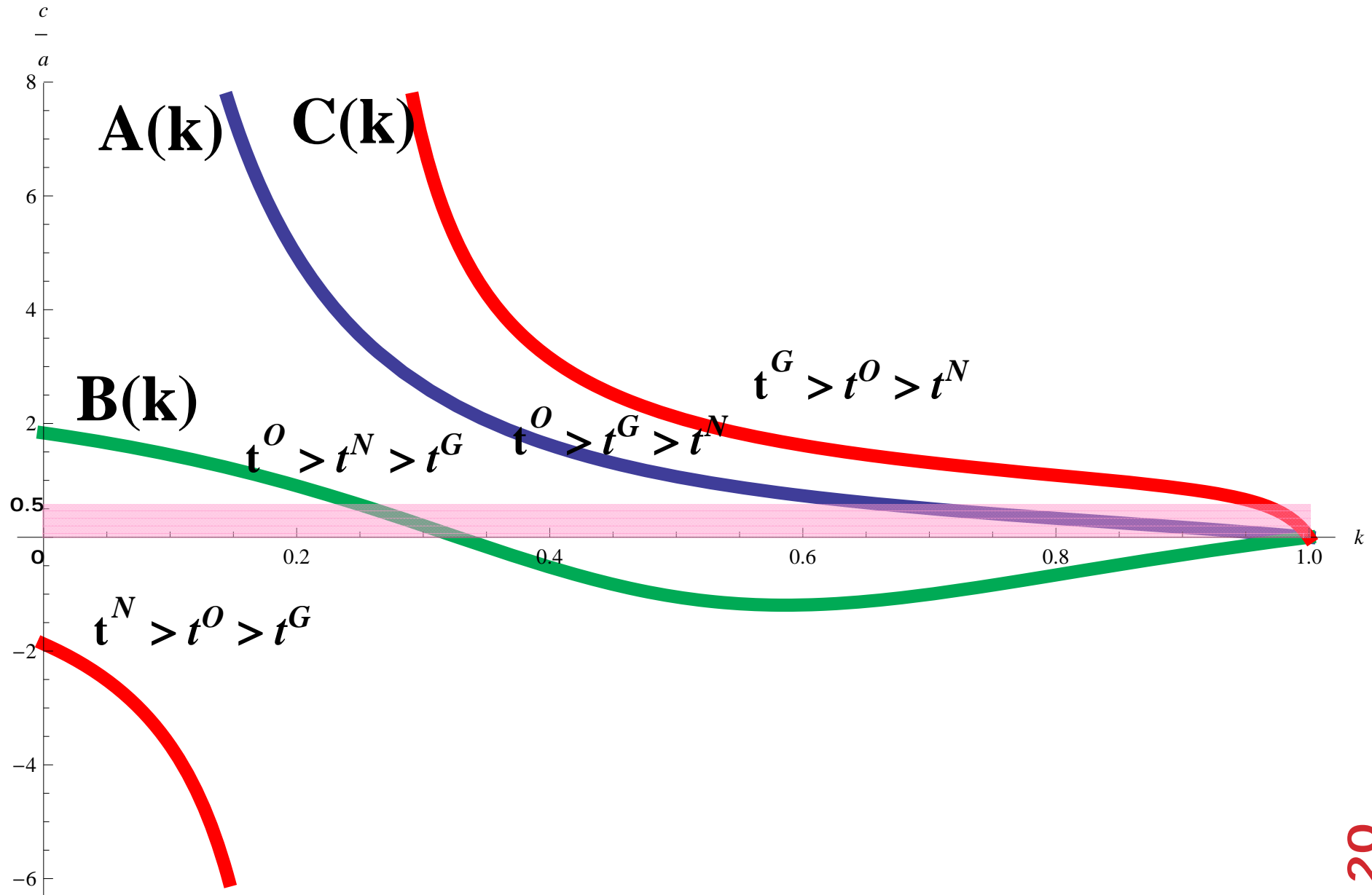
FOC for Home Firm:

$$0 = \frac{\partial U_H^e}{\partial \sigma_H} = \underbrace{\frac{\partial U_H}{\partial q_H} \frac{\partial q_H^e}{\partial \sigma_H}}_{\text{Excess Competition Effect}} + \underbrace{\frac{\partial U_H}{\partial q_F} \frac{\partial q_F^e}{\partial \sigma_H}}_{\text{Rent Shifting Effect}} + \underbrace{\frac{\partial U_H}{\partial t} \frac{\partial t^e}{\partial \sigma_H}}_{\text{Tariff Imposition Effect}} \rightarrow \sigma_H^o > 0$$

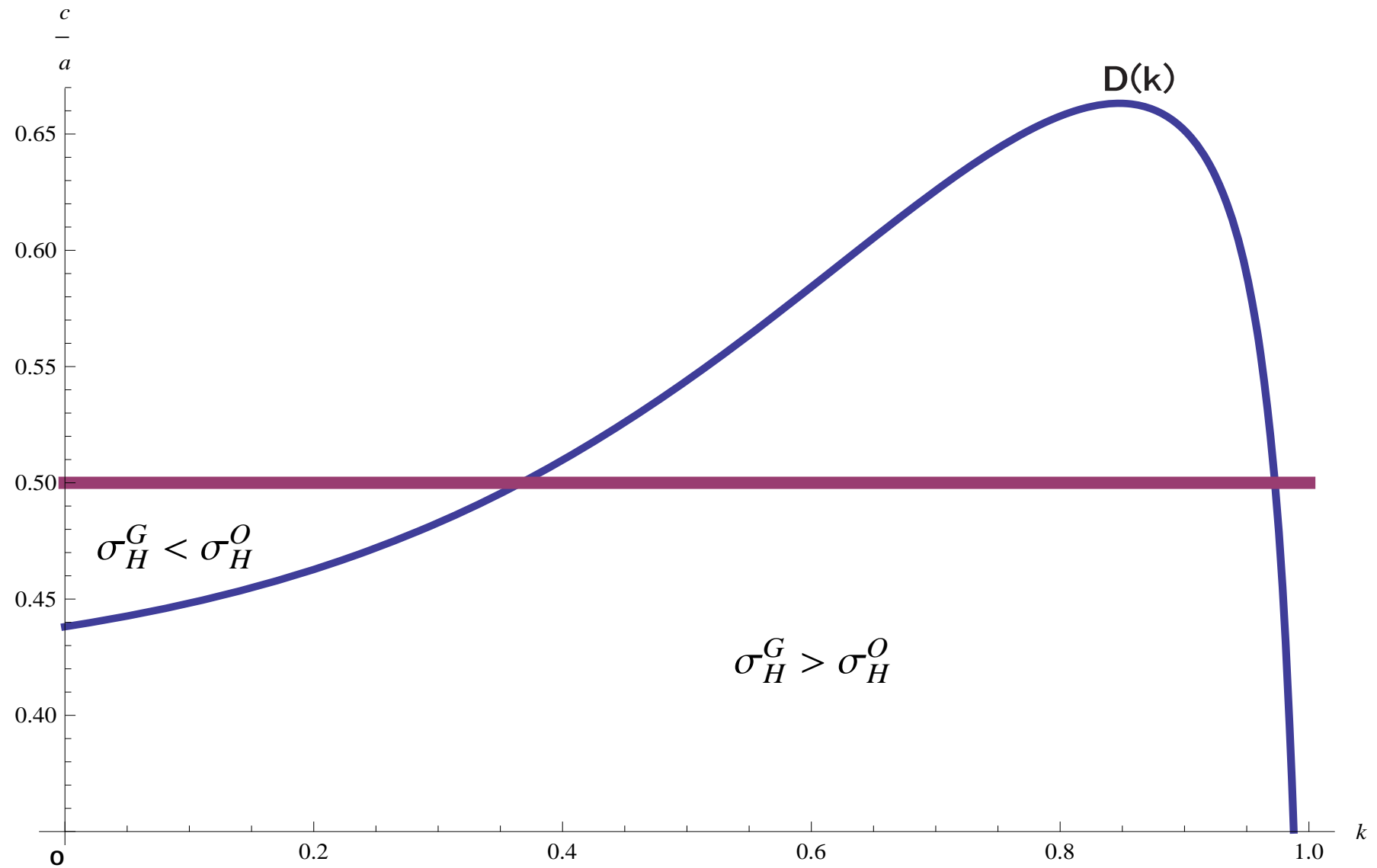
FOC for Foreign Firm:

$$0 = \frac{\partial \pi_F^e}{\partial \sigma_F} = \underbrace{\frac{\partial \pi_F}{\partial q_F} \frac{\partial q_F^e}{\partial \sigma_F}}_{\text{Excess Competition Effect}} + \underbrace{\frac{\partial \pi_F}{\partial q_H} \frac{\partial q_H^e}{\partial \sigma_F}}_{\text{Rent Shifting Effect}} + \underbrace{\frac{\partial \pi_F}{\partial t} \frac{\partial t^e}{\partial \sigma_F}}_{\text{Tariff Imposition Effect}} \rightarrow \underline{\sigma_F^o < 0}$$

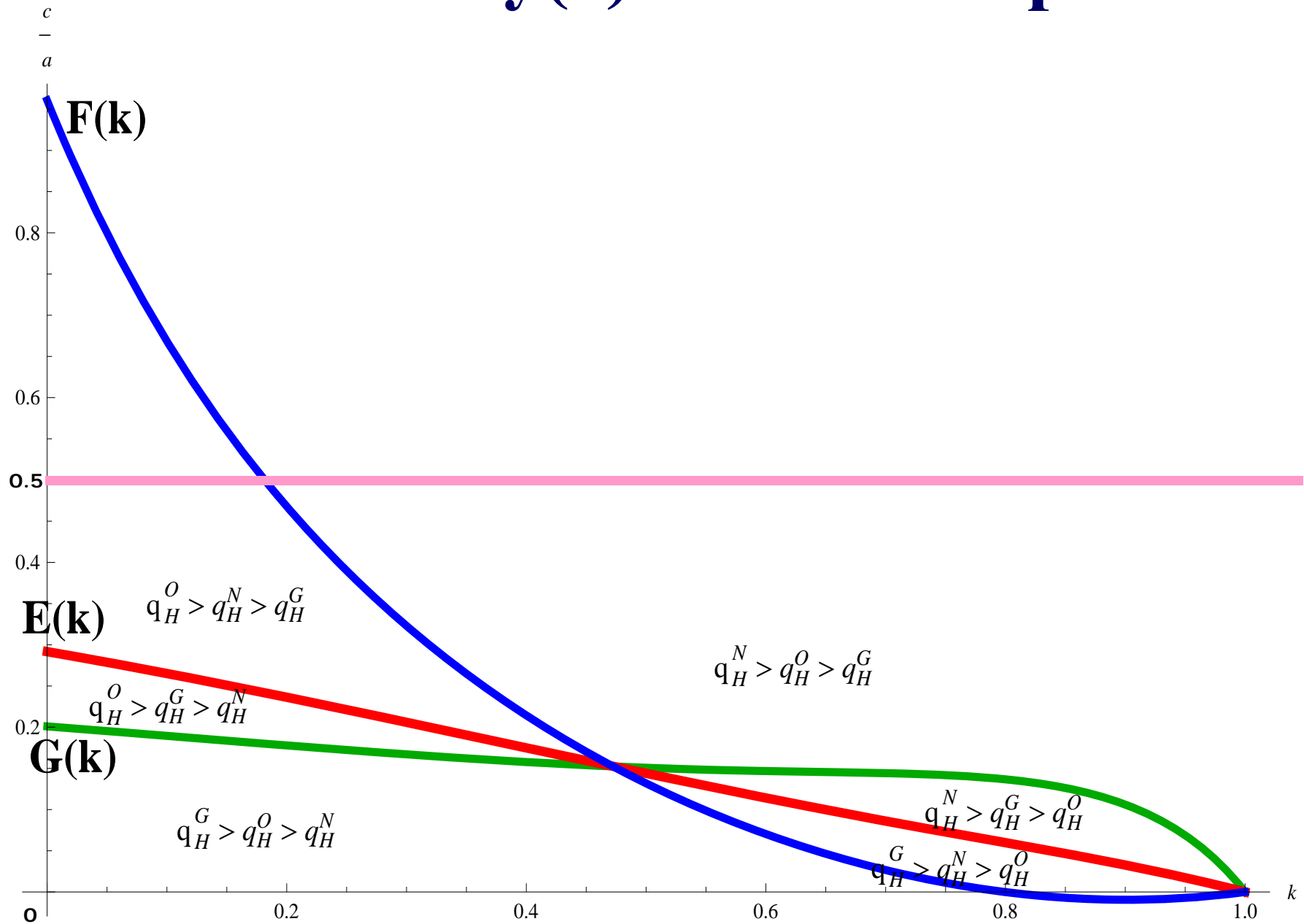
Summary(1): Import Tariff



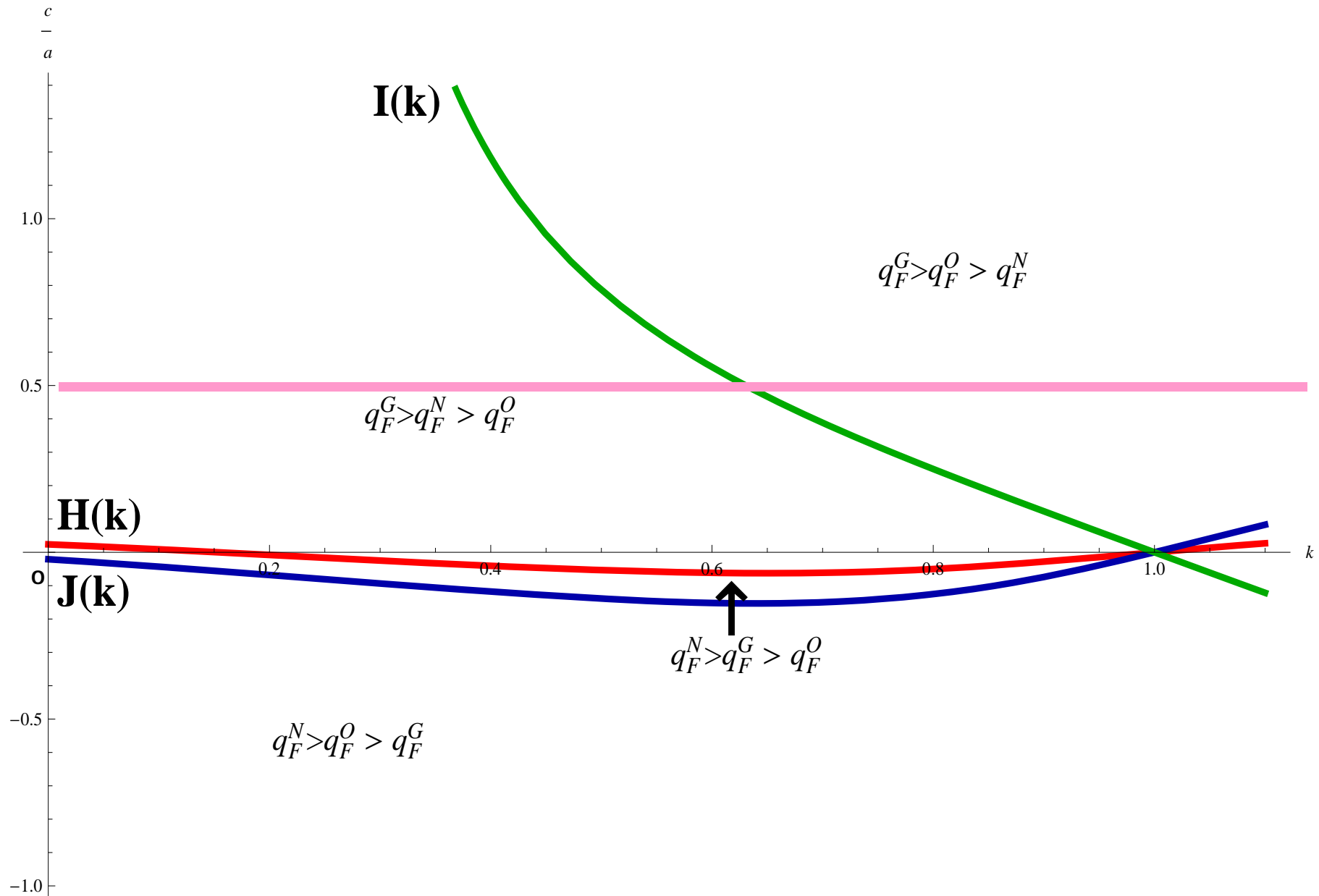
Summary(2): Owner's Subsidy Equivalent



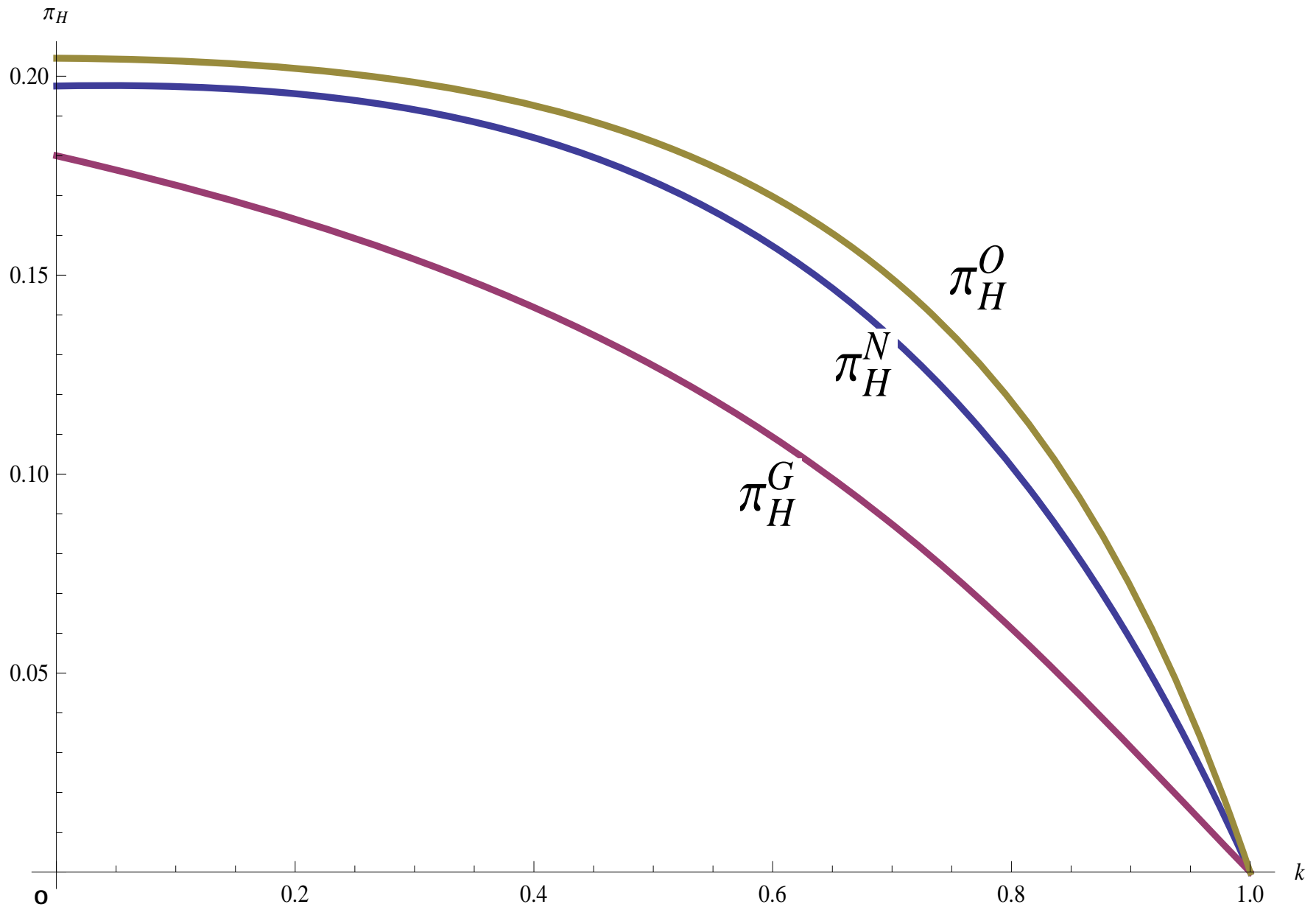
Summary(3): Home Output



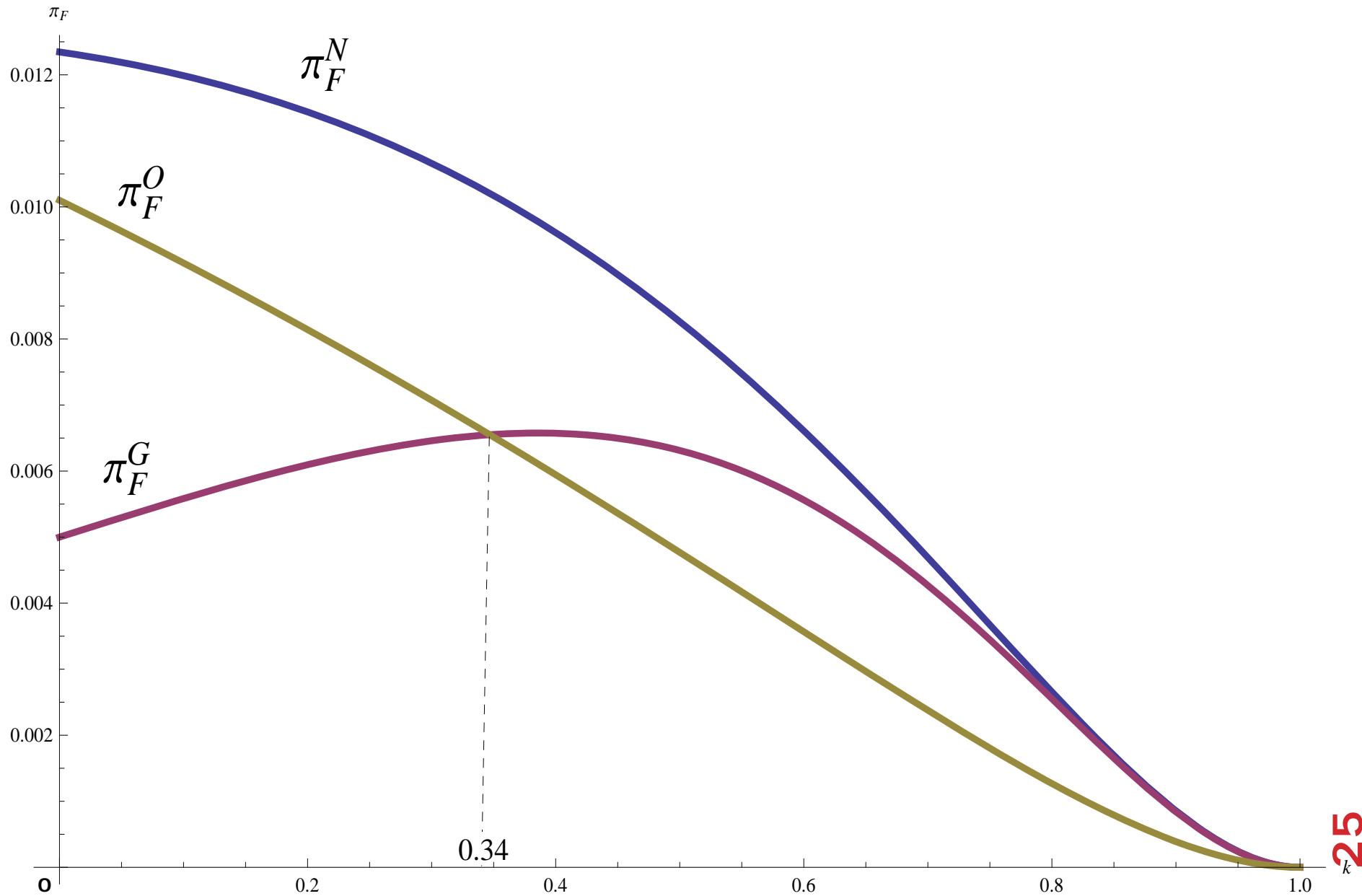
Summary(4): Foreign Output



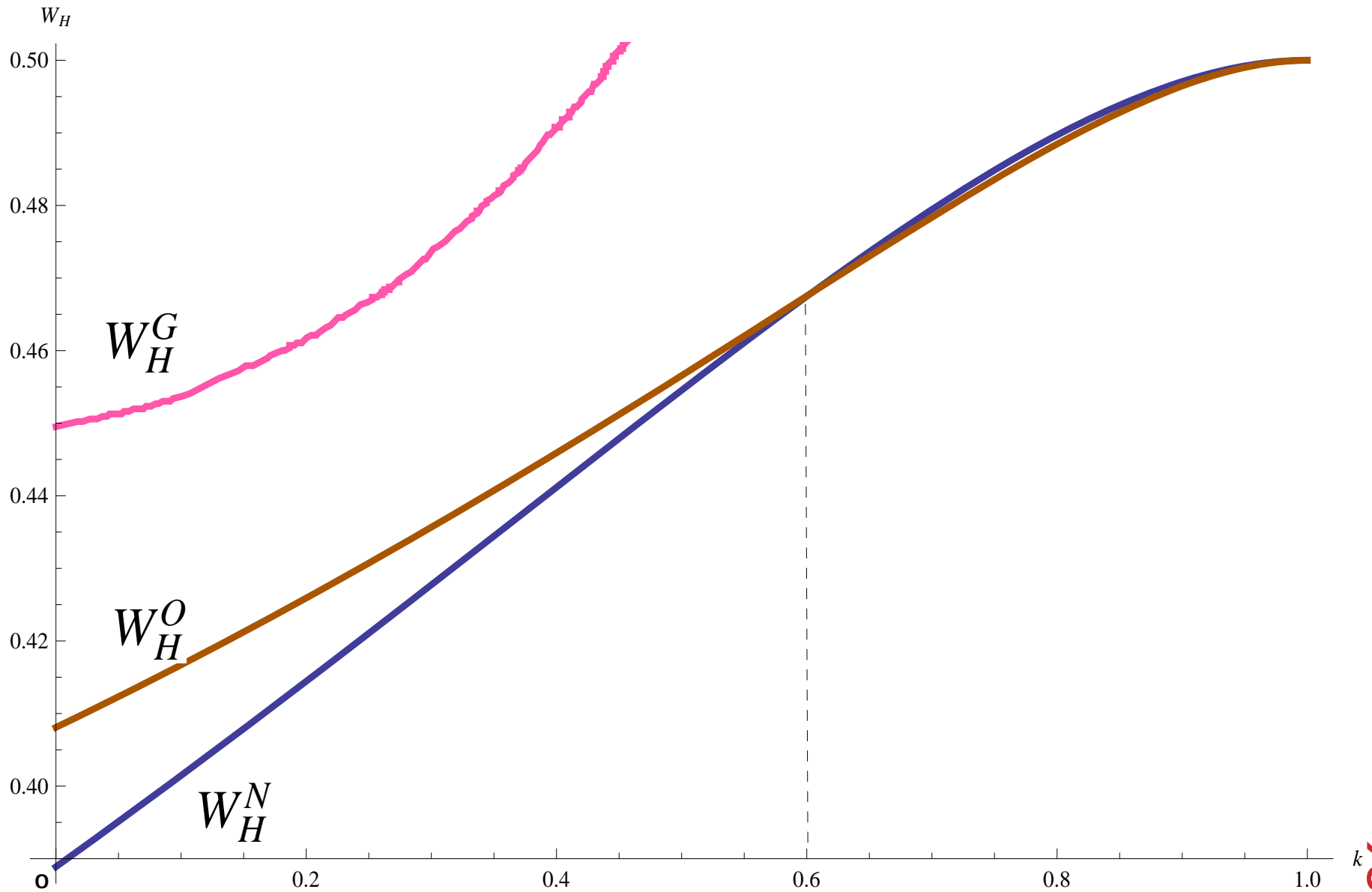
Summary(5): Home Profit



Summary(6): Foreign Profit



Summary(7): Home Welfare



Some Other Results

- **Foreign Owner's Subsidization Incentive is Dependent on the Move Orders**

- **For Home Owner**

$$\pi_H^O > \pi_H^N > \pi_H^G \quad \text{independent of } k$$

- **For Foreign Owner**

Managerial Delegation always yields Lower Profit

- **For Home Government**

First Mover Payoff is Much Larger than others