

10-1-09

- WELFARE ISSUE
PAYOFF GOVERNMENT
- ORIGINAL SPENCER BRANDER
MODEL
 (ONLY 1 COUNTRY
 CAN SUBSIDIZE/TAX
 EXPORTS
- OTHER POSSIBLE
 SET UPS:
 - QUANTITY COMPETITION { 2 COUNTRIES CAN
 SUBSIDIZE/TAX EXPORTS
 - PRICE COMPETITION
 - ONLY 1 COUNTRY
 CAN SUBS/TAX
 - 2 COUNTRIES CAN
 SUBS/TAX
- REMARKS ON
 THE GENERAL ISSUE
 OF X-SUBSIDIES.

GOV. PAYOFF = WELFARE

IN ~~GENERAL~~ GENERAL :

$$\text{CONS. SURPLUS} + \text{PROD. SURPLUS} + \text{GOV. REV.}$$

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FIRMS PROFITS

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- COST OF
SUBSIDY
PROGRAM.

LAST CLASS

ORIGINAL	SPENCER BRANDEN
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USING NE EQUATIONS:

$$S_1^* = 9$$

$$q_1^* = 12 + \frac{2}{3} 9 = 18$$

$$q_2^* = 12 - \frac{1}{3} 9 = 9$$

$$p^* = 12 - \frac{1}{3} 9 = 9$$

EFFECTIVE $\Pi_1^* = \underbrace{p^* q_1^*}_{\text{PROD. PROFITS}} + S_1 q_1^* = \frac{162}{162} = 324$

$$\Pi_2^* = p^* q_2^* = 81 = W_2^*$$

$$W_1^* = 162$$

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COMPARISON WITH
CASE OF NO GOV.

INTERVENTION : NE q 's
with $MC_1 = MC_2 = 0$

$$p = 36 - q_1 - q_2$$

$$q_1 = q_2 = 12$$

$$p = 12$$

$$\pi_1 = \pi_2 = 144$$

$$W_2 = W_1 = 144$$

"OPTIMAL SUBSIDY" OUTCOME
COINCIDES WITH OUTCOME
OF SEQ. QUANTITY GAME
WHEN FIRM 1 GOES
FIRST.

QUANTITY COMPETITION

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ORIGINAL S-BRAUER: ONLY 1
MODEL 1 COUNTRY
CHOOSE s_1

MODEL 2: BOTH COUNTRIES
CHOOSE s_1, s_2

MODEL 2

COUNTRIES 1 & 2
CHOOSE s_1, s_2

(i.e. NE in s_1, s_2)

FIRMS 1 & 2
CHOOSE q_1, q_2

(i.e. NE in q_1, q_2)

SPNE:

STEP 1: FIND NE q 'S
ASSUMING FIRMS HAVE EFFECTIVE
MC'S EQUAL TO c_1, c_2

STEP 2: FIND NE IS s_1, s_2
ASSUMING COUNTRIES MAX WELFARE
& FIRMS PRODUCE NE. QUANTITIES.

STEP 1: $p = 36 - q_1 - q_2$ (5)
 NE q_1 's c_1, c_2

\Rightarrow (DONE LAST CLASS)
 MAX $q_1 [p - c_1] q_1 = [36 - c_1 - q_1 - q_2] \cdot q_1$

$\otimes \frac{\partial}{\partial q_1} = 0$

MAX $q_2 [p - c_2] q_2 = [36 - c_2 - q_1 - q_2] q_2$

$\otimes \otimes \frac{\partial}{\partial q_2} = 0$

SOLVING \otimes & $\otimes \otimes \Rightarrow$

$$\begin{aligned} q_1 &= \frac{1}{3} [36 - 2c_1 + c_2] \\ q_2 &= \frac{1}{3} [36 - 2c_2 + c_1] \\ p &= \frac{1}{3} [36 + c_1 + c_2] \end{aligned}$$

STEP 2: NE in s 's

ASSUMING

MAX $s_1 W_1(s_1, s_2) = p q_1$ OR
 = EFFECT. PROFIT $s_1 - s_1 \cdot q_1$

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$$\text{MAX}_{s_1} w_1(s_1, s_2) = \frac{1}{3} [36 + c_1 + c_2] \cdot 9$$

$$= \frac{1}{3} [36 + c_1 + c_2] \cdot \frac{1}{3} [36 - 2c_1 + c_2]$$

$$c_1 = -s_1$$

$$c_2 = -s_2$$

$$= \frac{1}{9} [36 - s_1 - s_2] [36 + 2s_1 - s_2]$$

$$\frac{\partial w_1}{\partial s_1} = \frac{1}{9} \left\{ [36 + 2s_1 - s_2](-1) + 2[36 - s_1 - s_2] \right\} = 0$$

$$\Rightarrow \boxed{s_1 = R_1(s_2) = \frac{36 - s_2}{4}}$$

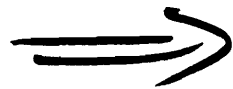
SIMILARLY

$$\text{MAX}_{s_2} w_2(s_1, s_2)$$

$$\Rightarrow \boxed{s_2 = R_2(s_1) = \frac{36 - s_1}{4}}$$

Solving Δ & $\Delta\Delta$

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$$S_1^* = S_2^* = 7.2$$

$$W_1 = W_2 = p q_i = 103.7$$

$$q_1 = q_2 = 14.4$$

$$p = 7.2$$