

III TWO COUNTRIES

MULTIPLE INVENTIONS

COUNTRY A: ALL INVENTIONS TAKE PLACE HERE

COUNTRY B: NO INVENTIONS / ONLY CONSUME GOODS.

ASSUME COUNTRY B IS SMALLER THAN COUNTRY A.

WE WILL STUDY 2 REGIMES:

① RESTRICTED PATENT PROTECTION

PATENTS ARE ONLY GRANTED IN COUNTRY A.

SINCE COUNTRY B DOES NOT HAVE PATENTS

LEVEL OF PRODUCTION IS AT $p=MC$

② EXTENDED PATENT PROTECTION

BOTH COUNTRIES GRANT PATENTS

(\Rightarrow MONOPOLY PRICING IN BOTH COUNTRIES)

① RESTRICTED PATENT PROTECTION (π)

SINCE PROFITS FROM COUNTRY B ARE ZERO, THE INVENTOR DECIDES HIS INVESTMENT LEVEL LOOKING ONLY AT π^A .

PROFIT MAXIMIZATION \Rightarrow

$\pi^A(I^A) \Rightarrow$ INVENTION LEVEL I^A IS THE SAME AS IN THE CLOSED ECONOMY CASE

COUNTRY A NET GAIN FOR SOCIETY:

$$N^A = \int_0^{I^A} \pi^A(I^A) - I^A$$

$$= u_1 + \overbrace{u_1 + u_2 + u_3} - \overbrace{(u_1 + u_2)}$$

$$= \boxed{u_1 + u_3}$$

SEE FIG 3

COUNTRY B ONLY CONSUMES \Rightarrow

NET GAIN FOR SOCIETY: $N^B = \int_0^{I^A} \pi^B(I^A) = \boxed{u_1 + u_2 + u_3}$

② EXTENDED PATENT PROTECTION

NOW THE FUNDOR DECIDES ON HIS INVESTMENT LEVEL LOOKING AT $\pi^A + \pi^B$.

PROFIT MAX \Rightarrow

$$\pi^A(I^e) + \pi^B(I^e) = 1$$

SO EXTENDING PATENT PROTECTION IN COUNTRY B INCREASES RESEARCH INVESTMENT SINCE THE NEW EQUILIBRIUM INVESTMENT LEVEL I^e IS LARGER THAN I^1 .

COUNTRY A: NET GAIN FOR SOCIETY:

$$NAe = S^{MA}(I^e) + \pi^A(I^e) + \pi^B(I^e) - I^e$$

SEE FIG. 3

$$= \underbrace{u_1 + u_5}_{\text{Country A}} + \underbrace{u_1 + u_2 + u_3 + u_4 + u_5 + u_6 + u_7 + u_8}_{\text{Both Countries}} - \underbrace{(u_1 + u_2 + u_3 + u_4 + u_5 + u_6 + u_7 + u_8)}_{\text{Country B}}$$

$$= u_1 + u_3 + u_4 + u_5 + u_8$$

THIS IS LARGER THAN NA^1 (SEE PAGE 7)

SINCE $NA^1 = u_1 + u_3$

SO COUNTRY A GAINS WHEN PATENT PROTECTION IS EXTENDED

COUNTRY B:

NET GAIN FOR SOCIETY:

$$NBe = S^{MB}(I^e) = u_1 + u_4$$

COMPARING NBe WITH NB^1 (SEE PAGE 7), WE SEE

THAT $NB^1 = u_1 + u_2 + u_3 > NBe = u_1 + u_4$

SINCE

$$u_2 + u_3 > u_4 \quad (\text{LOOKING AT DIAGRAM})$$

SO COUNTRY B LOSES WHEN PATENT PROTECTION IS EXTENDED

HOW ABOUT WORLD WELFARE?

NEED TO COMPARE

GAINS FOR A: $w_4 + w_5 + w_8$

WITH

LOSSES FOR B: $w_4 - (w_2 + w_3)$

THE RESULT DEPENDS ON THE RELATIVE SIZES OF THE COUNTRIES -

IF COUNTRY A IS HUGE & B VERY SMALL
) EXTENDING PATENT PROTECTION \rightarrow WELFARE -

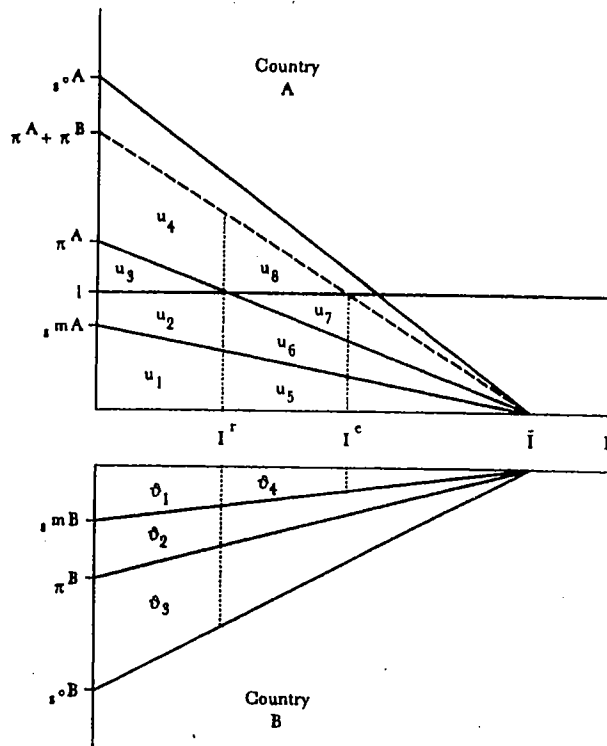


FIGURE 3. Welfare effects in two countries of inventions in one, with restricted and extended patent protection.