

The *wholesale* competition in International Telecommunications System

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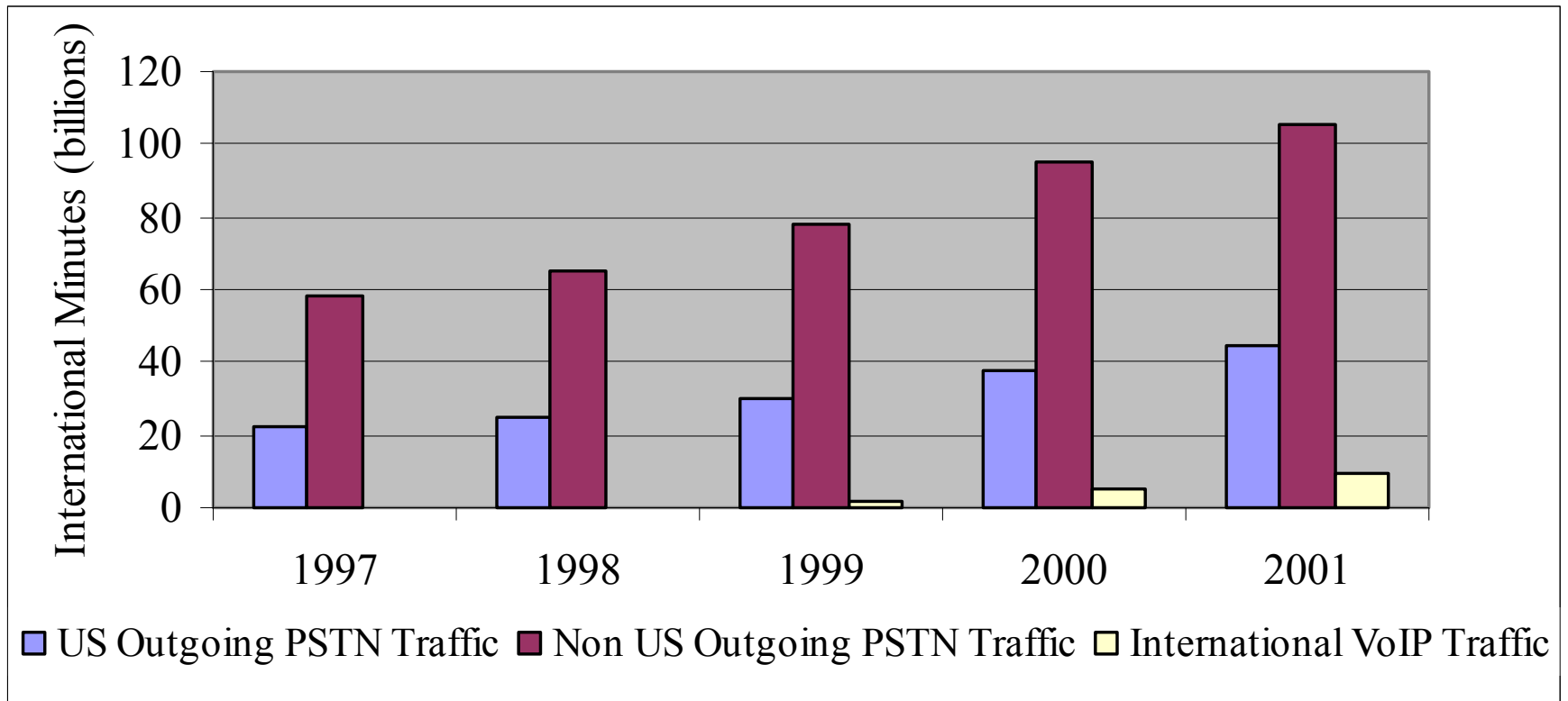
Summary

- Introduction on International Telecommunications
- The Carter and Wright model
- The new competitive model
- Carrier Strategies
- Conclusions

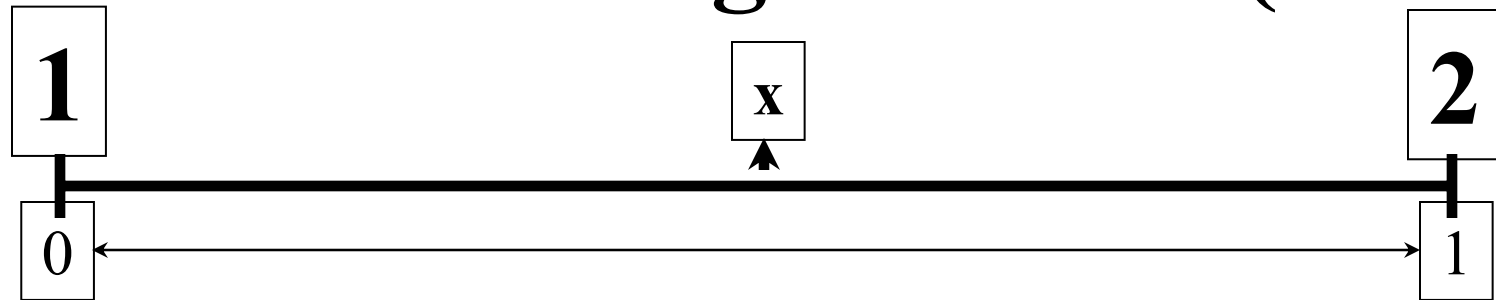
Ten years of change in International traffic

Indicator	1990	1995	2000
International Traffic (Billions of minutes)	33.5	61.6	132.7
Revenue from International Traffic (Billions of US\$)	37	55	70
Countries permitting carrier competition	6	18	49

International VoIP and PSTN traffic Summary 1997-2001



Carter e Wright model (1999)



Surplus $\Rightarrow w_i = v(p_i) - r_i$ $v(p_i) = \max \{u(q) - pq\}$

additional benefits

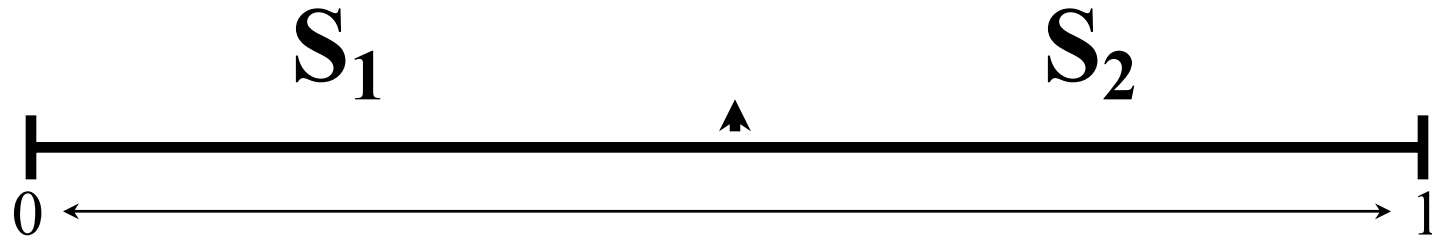
$$\theta_1 = \beta/2\sigma + (1-x)/2\sigma \quad ; \quad \theta_2 = x/2\sigma$$

Indifferent additional benefits

$$\theta_1 = \theta_2$$

$$\beta/2\sigma + (1-x)/2\sigma = x/2\sigma$$

Carter e Wright model (1999)



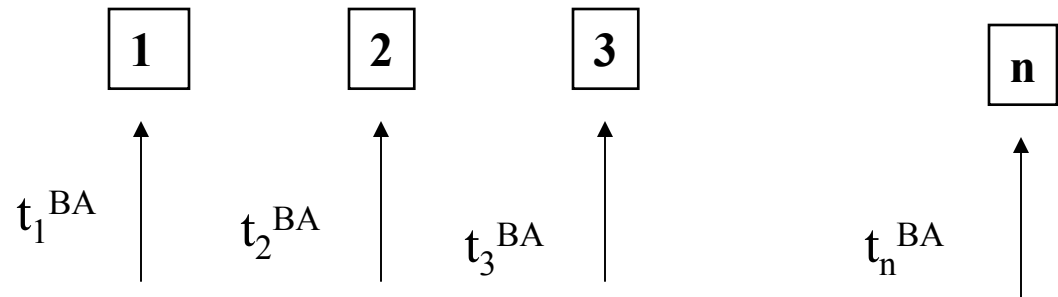
Market shares

$$S_1 = \frac{1}{2} + \frac{\beta}{2} + \sigma (w_1 - w_2)$$

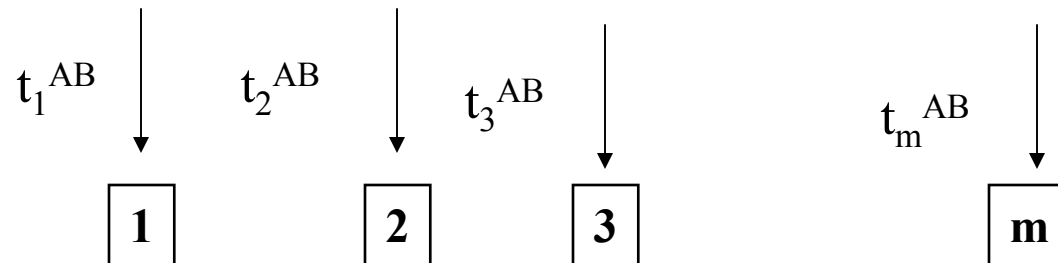
$$S_2 = \frac{1}{2} - \frac{\beta}{2} + \sigma (w_2 - w_1)$$

New competitive scenario

Final Market A



Intermediate market



Final Market B

New competitive model

$$W_1 + \beta/2\sigma + (1-S_1^A)/2\sigma = W_2 + (1-S_2^A)/2\sigma$$

$$W_2 + (1-S_2^A)/2\sigma = W_3 + (1-S_3^A)/2\sigma$$

.....

$$W_{n-1} + (1-S_{n-1}^A)/2\sigma = W_n + (1-S_n^A)/2\sigma$$

Subject to $\sum S_j = 1$

New competitive model

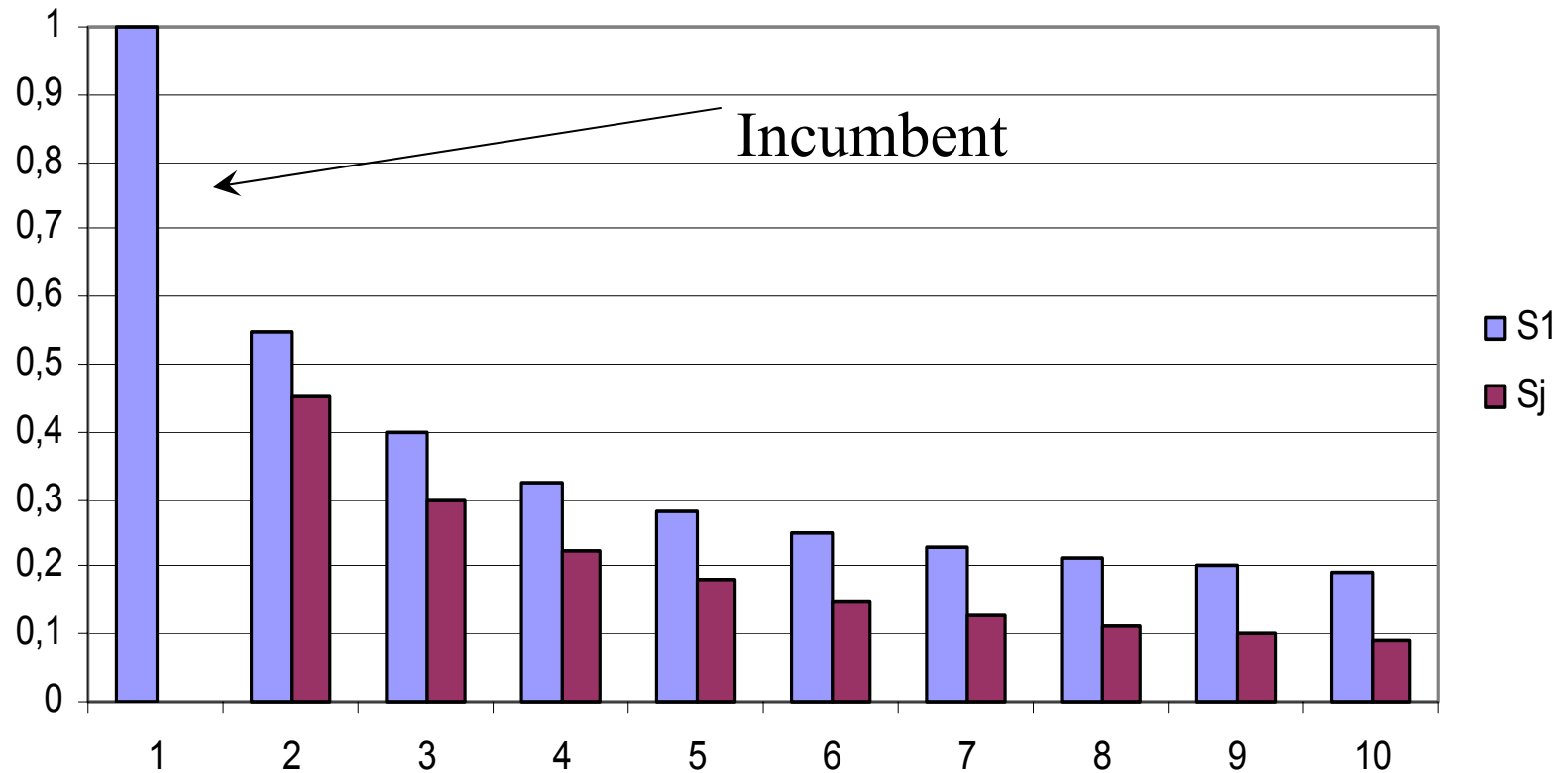
The market share in the final market A

$$S_1 = \frac{1 + (n-1)\beta}{n} + \frac{2\sigma}{n} \left(nw_1 - \sum_{j=1}^n w_j \right)$$

$$S_j^A = \frac{1 - \beta}{n} + \frac{2\sigma}{n} \left(nw_j - \sum_{j=1}^n w_j \right)$$

for every $j \geq 2$

Relation between market shares and number of carriers



New competitive model

Profit functions of generic carrier j

$$\pi_j^A = (p_j^A - c_j^A - t_j^{AB})q^{AB}S_j^A + (r_j^A - f_j^A)S_j^A$$

if $t_j^{BA} > t_i^{BA}$

$$\pi_j^A = (p_j^A - c_j^A - t_j^{AB})q^{AB}S_j^A + (r_j^A - f_j^A)S_j^A$$

$+ (t_j^{BA} - c_j^A)q^{BA}$ **if** $t_j^{BA} \leq t_i^{BA}$

Carriers Strategies

Incumbent maximazing profit price
(Bertrand competition in the final market A):

$$p_j^A = \frac{1}{2} \left(\frac{a}{b} + c_j^A + t_j^{AB} \right)$$

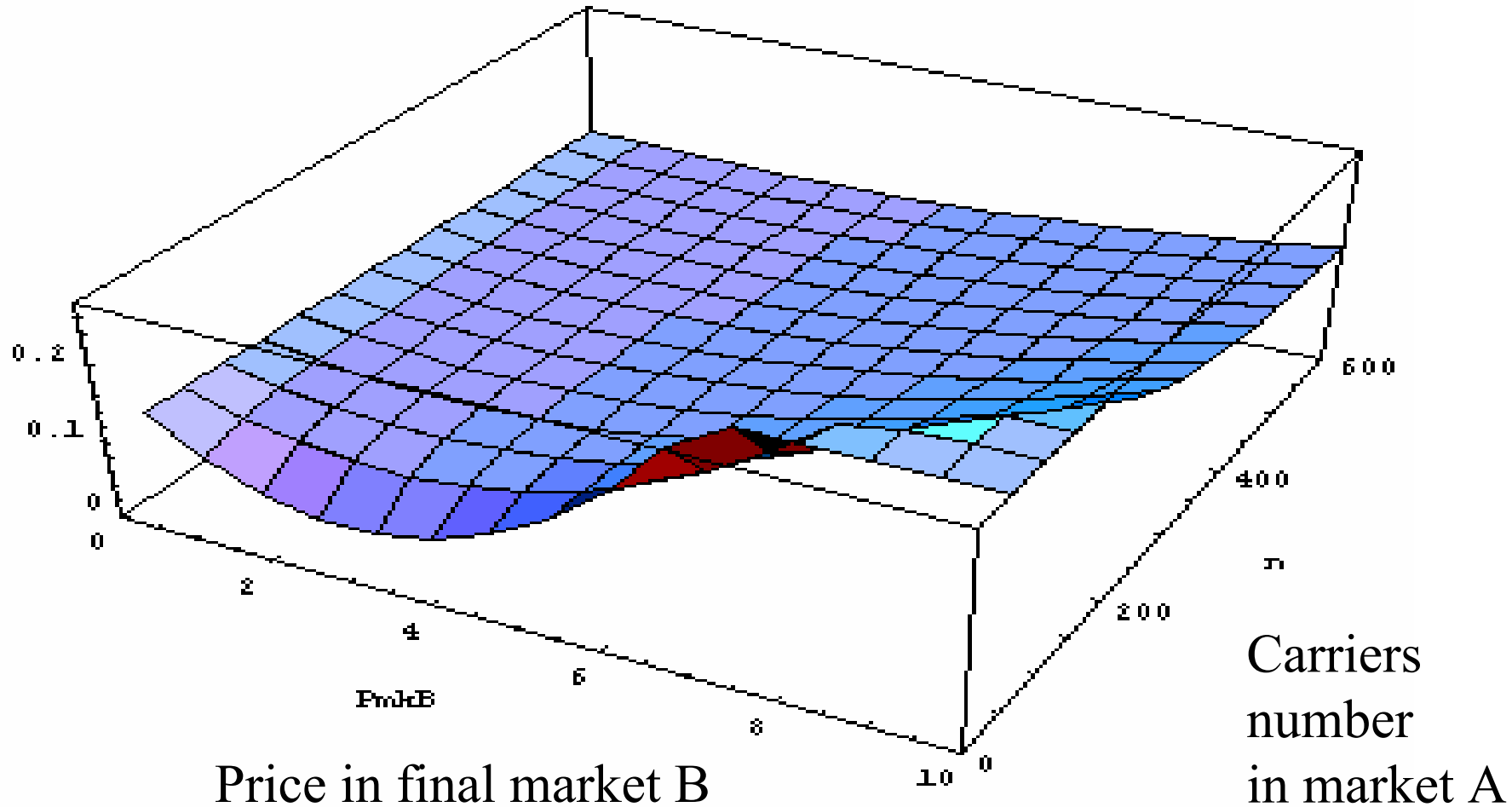
Carriers Strategies

Incumbent undercutting strategy

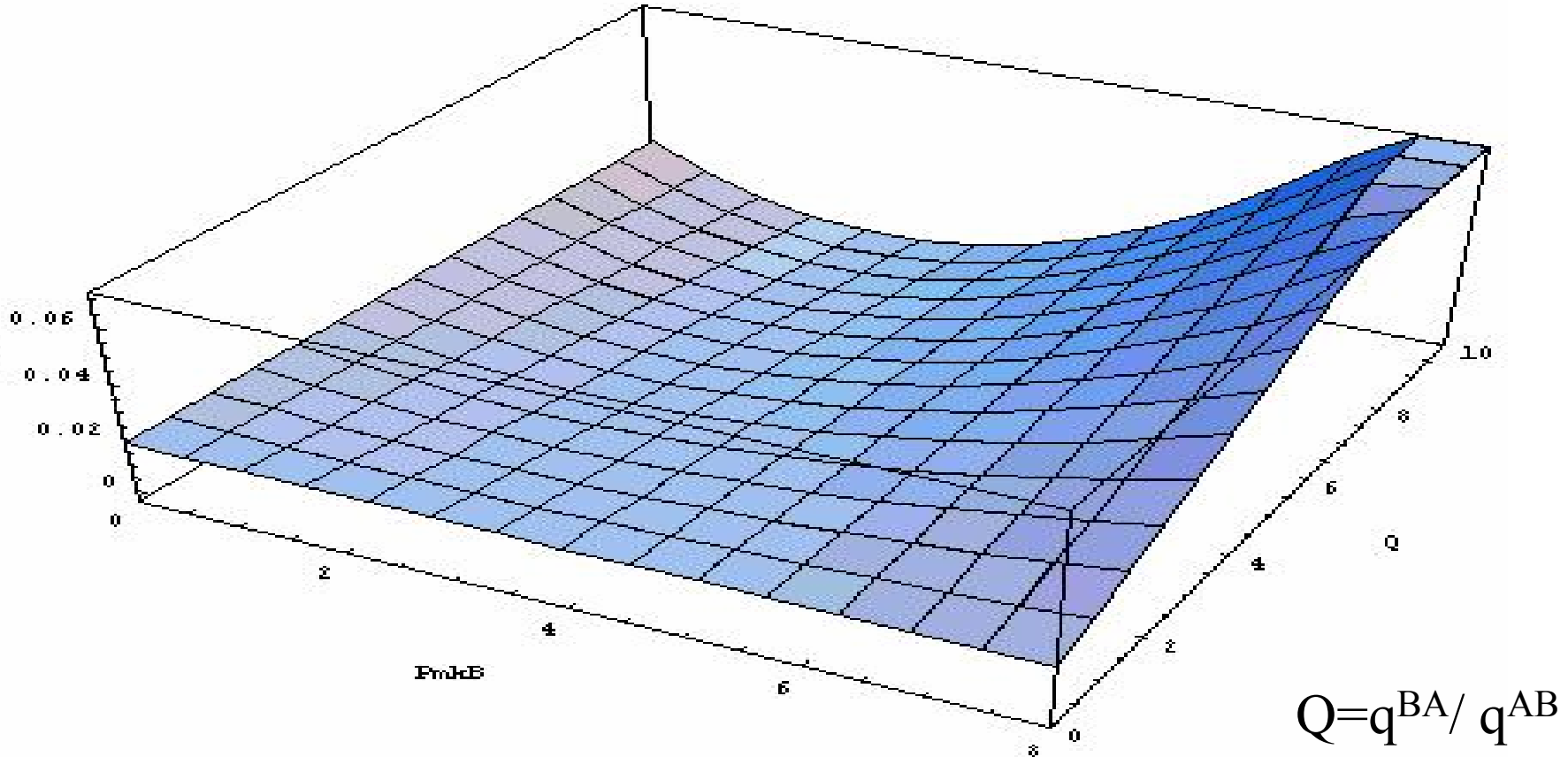
$$t^{\text{incumbent}} = t_j^{\text{BA}} - \varepsilon$$

$$t_j^{\text{BA}} = c_j^{\text{A}} - (p_j^{\text{A}} - c_j^{\text{A}} - t_j^{\text{AB}}) S_j^{\text{A}} \frac{q^{\text{AB}}}{q^{\text{BA}}} - (r_j^{\text{A}} - f_j^{\text{A}}) \frac{S_j^{\text{A}}}{q^{\text{BA}}}$$

Incumbent market A price level undercutting strategy

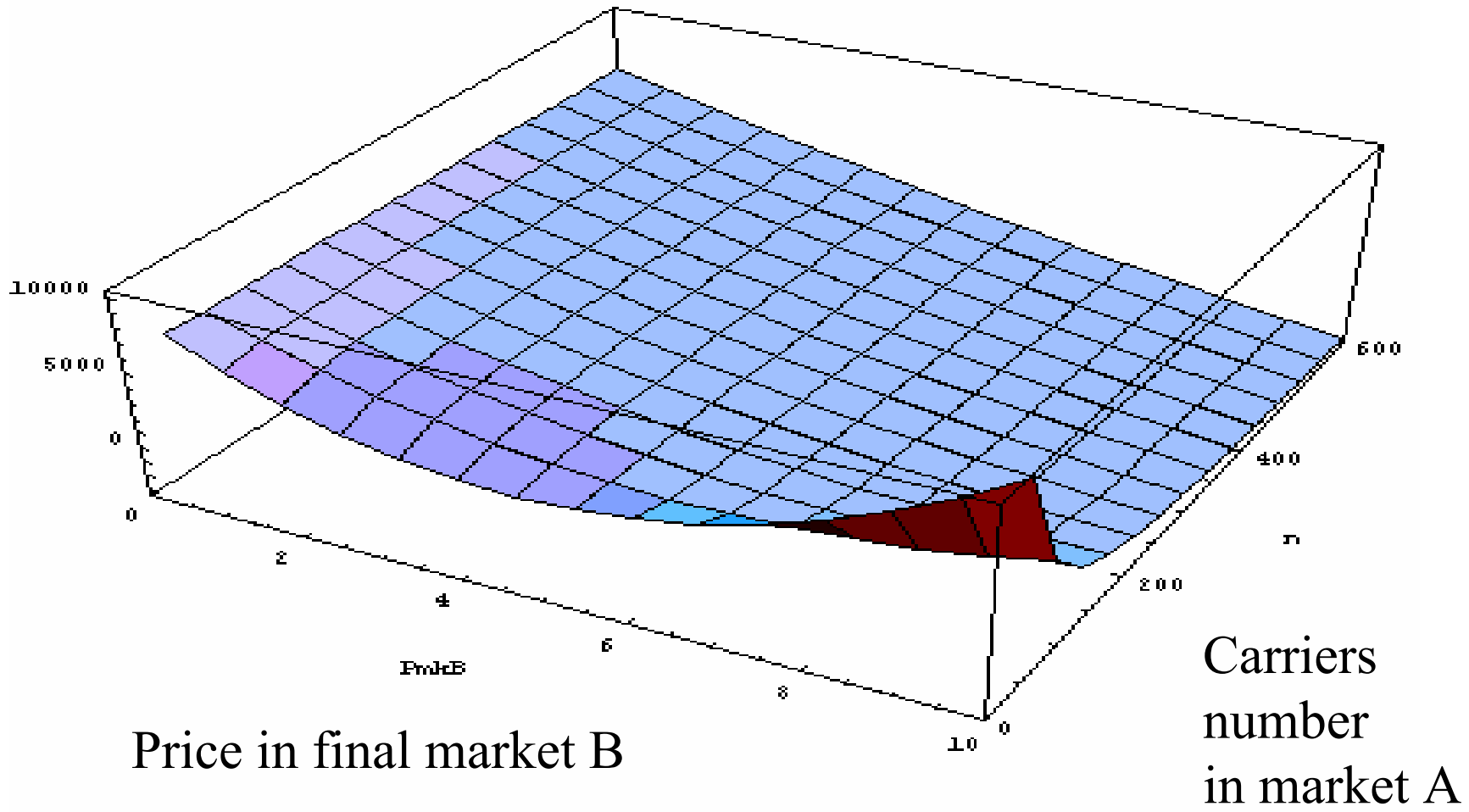


Incumbent market A tariff level undercutting strategy



Price in final market B

Incumbent market A profit undercutting strategy



Carriers Strategies

Bertrand Competition

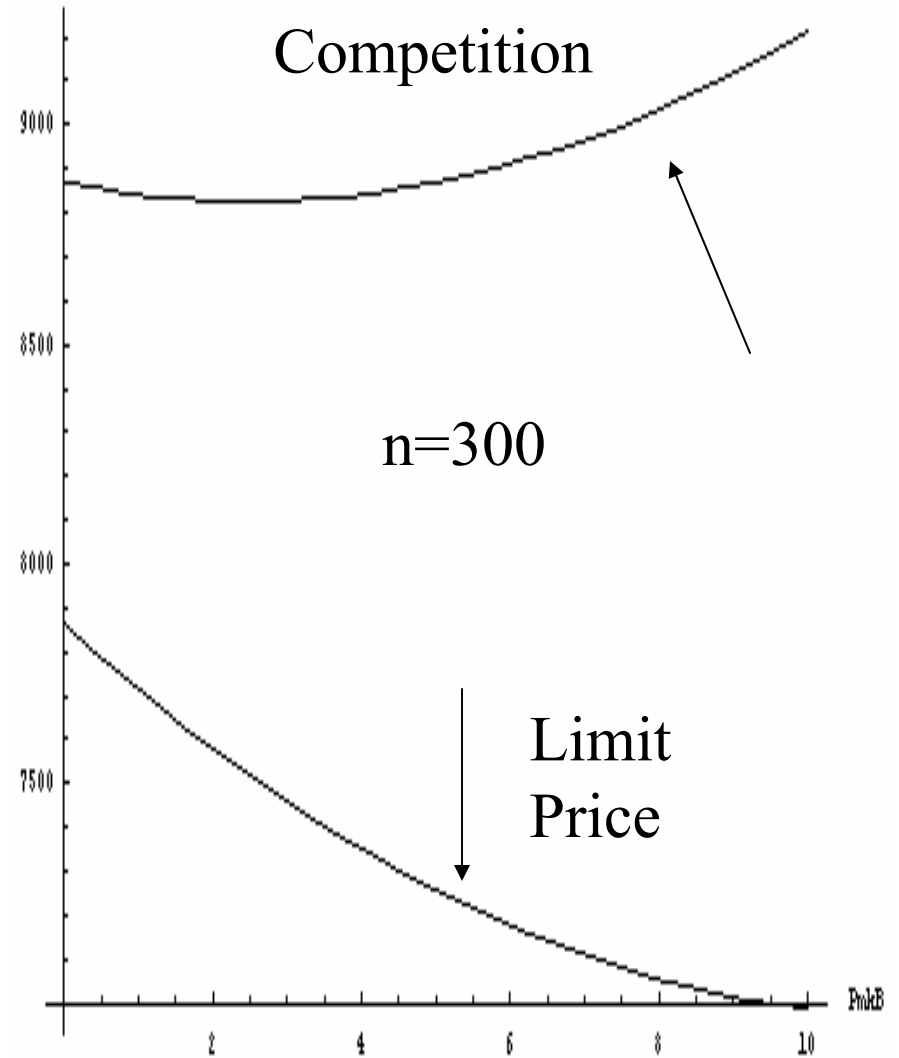
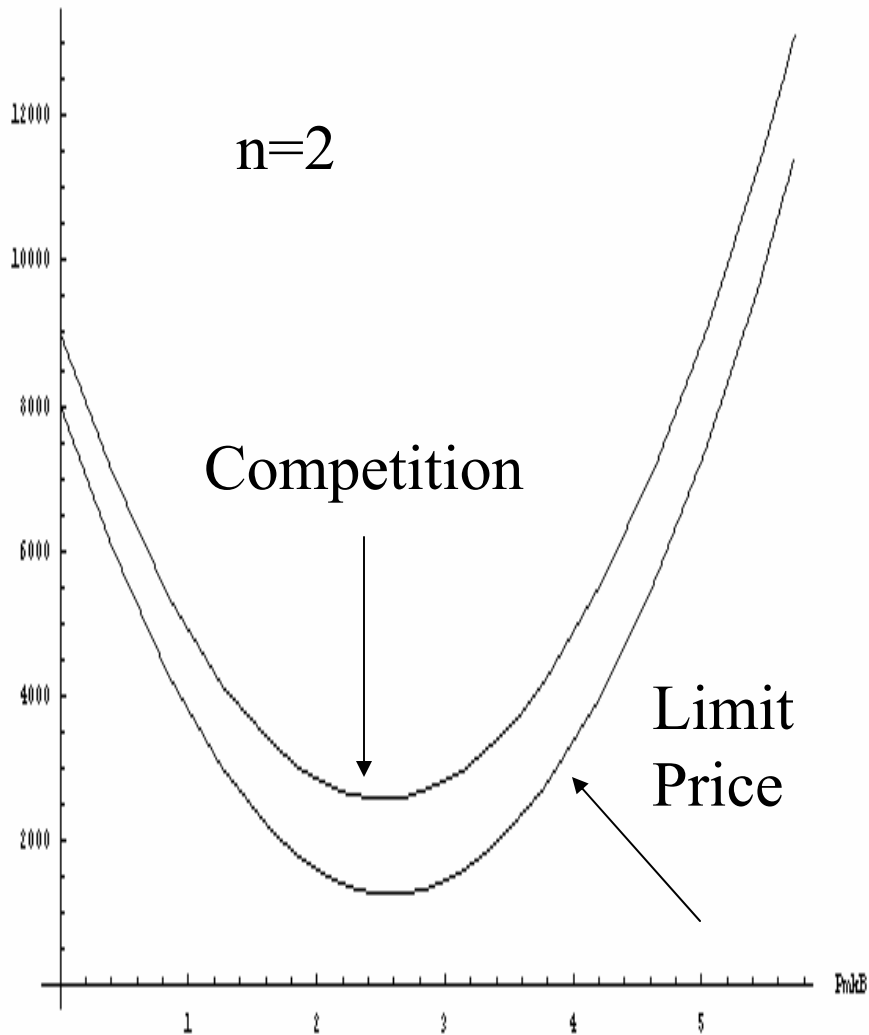
$$t_j^{BA} = m - kq^{BA}$$

$$\pi_j^A = (p_j^A - c_j^A - t_j^{AB})q^{AB}S_j^A + (r_j^A - f_j^A)S_j^A +$$

$$+ (t_j^{BA} - c_j^B) \left(\frac{-t_j^{BA}}{k} + \frac{m}{k} \right)$$

$$(t_j^{BA})^* = \frac{m + c_j^B}{2}$$

Profits Comparison



Carriers Strategies

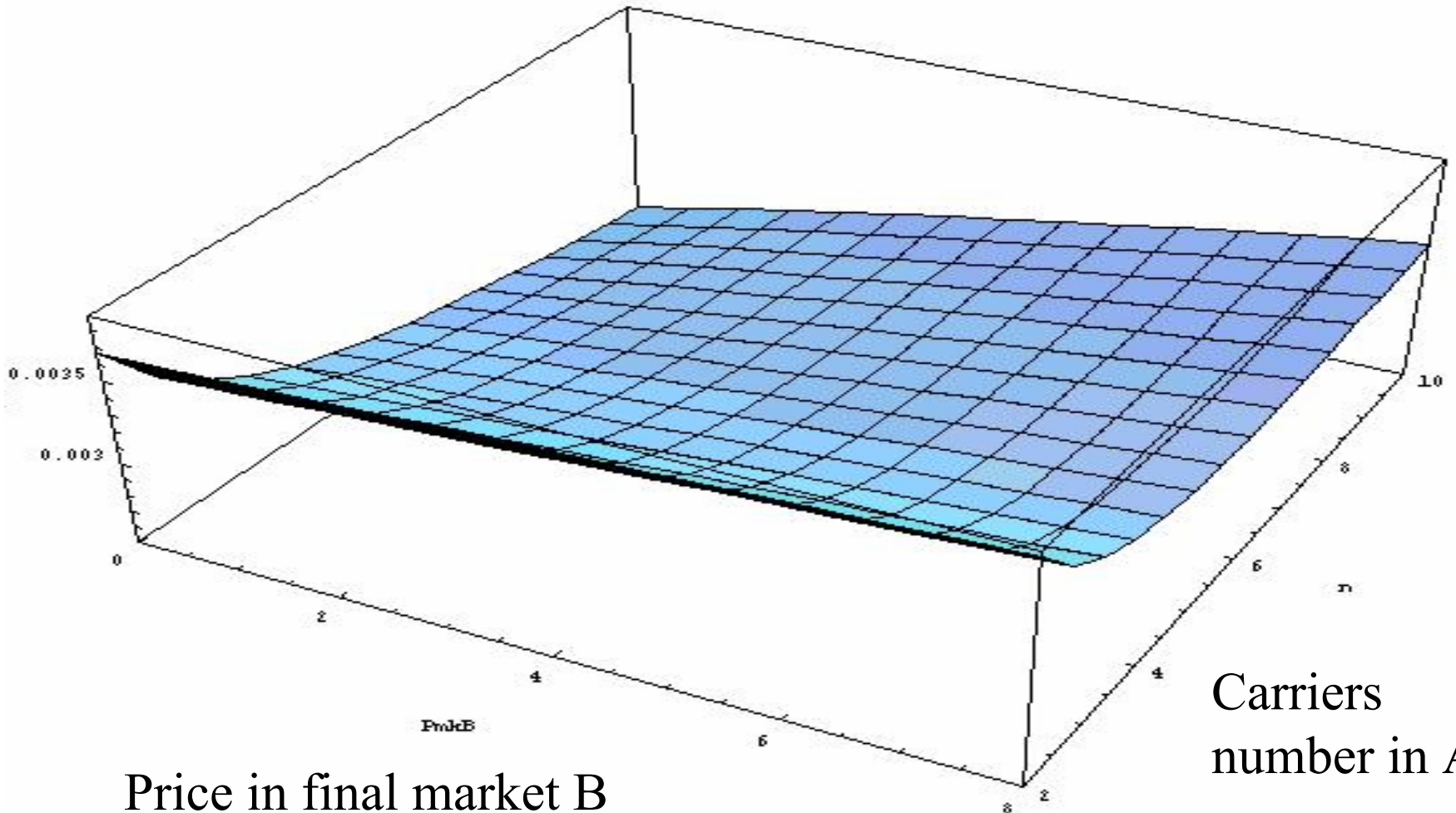
Bertrand Competition with the follower undercutting strategy in the final market

$$t_{\text{follower}} = t_j^{\text{AB}} + \varepsilon$$

$$S_{\text{new}}^{\text{A}} =$$

$$= \frac{(p_j^{\text{A}} - c_j^{\text{A}} - t_j^{\text{AB}})S_{\text{old}}^{\text{A}} q^{\text{AB}} + (r_j^{\text{A}} - f_j^{\text{A}})S_{\text{old}}^{\text{A}} + q^{\text{BA}} \varepsilon}{(p_j^{\text{A}} - c_j^{\text{A}} - t_j^{\text{AB}})q^{\text{AB}} + (r_j^{\text{A}} - f_j^{\text{A}})}$$

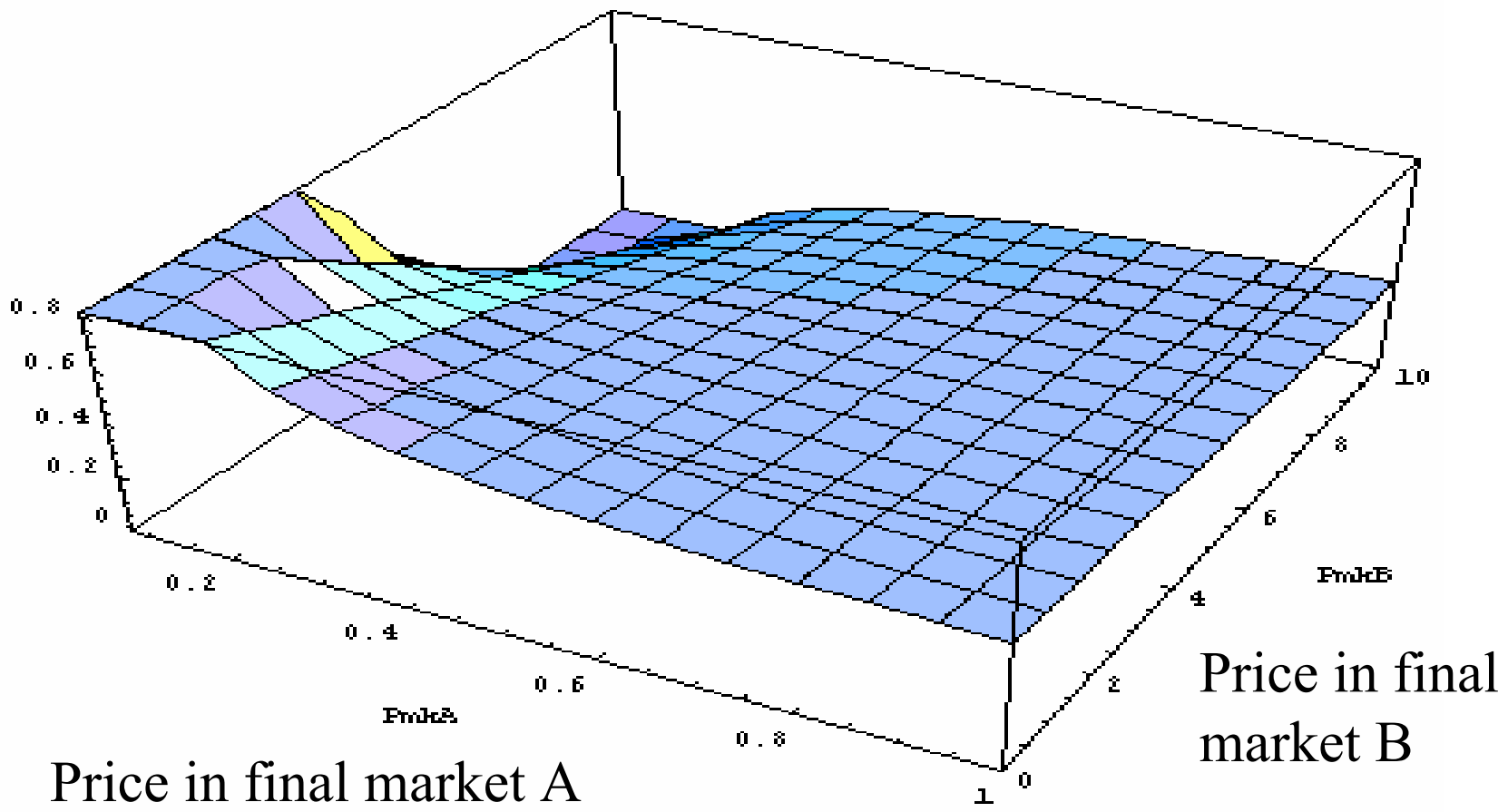
Follower market A price level competition



Price in final market B

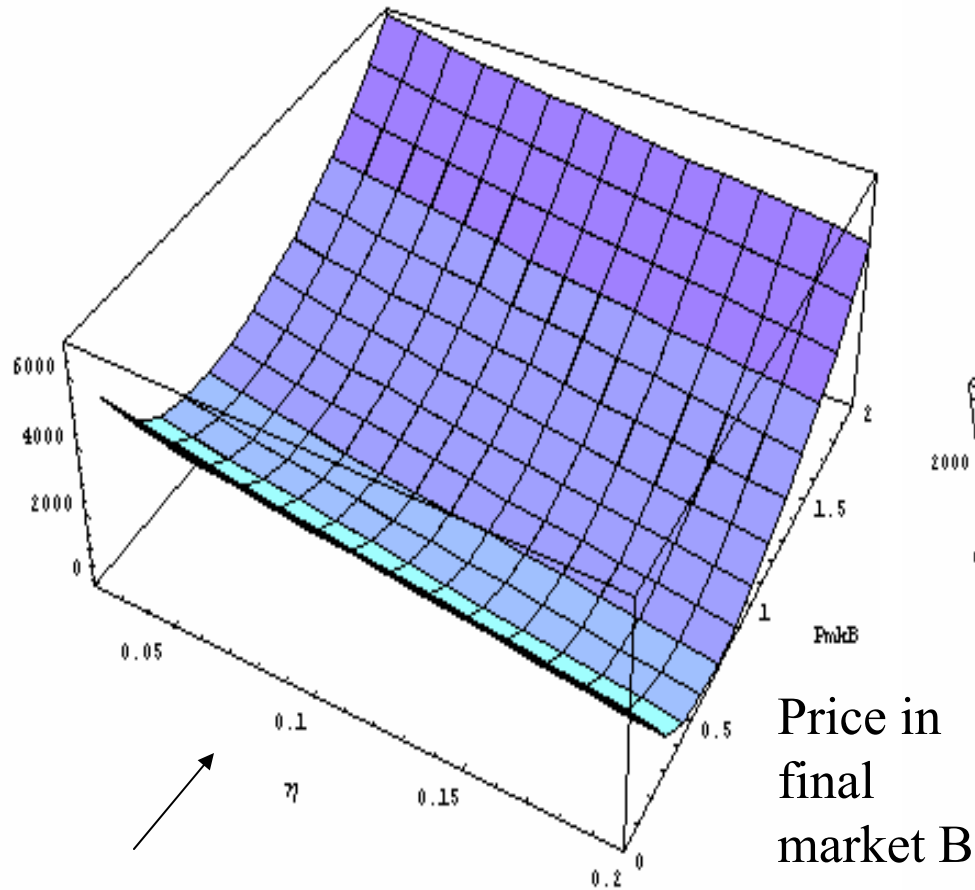
Carriers
number in A

Follower market share – competition



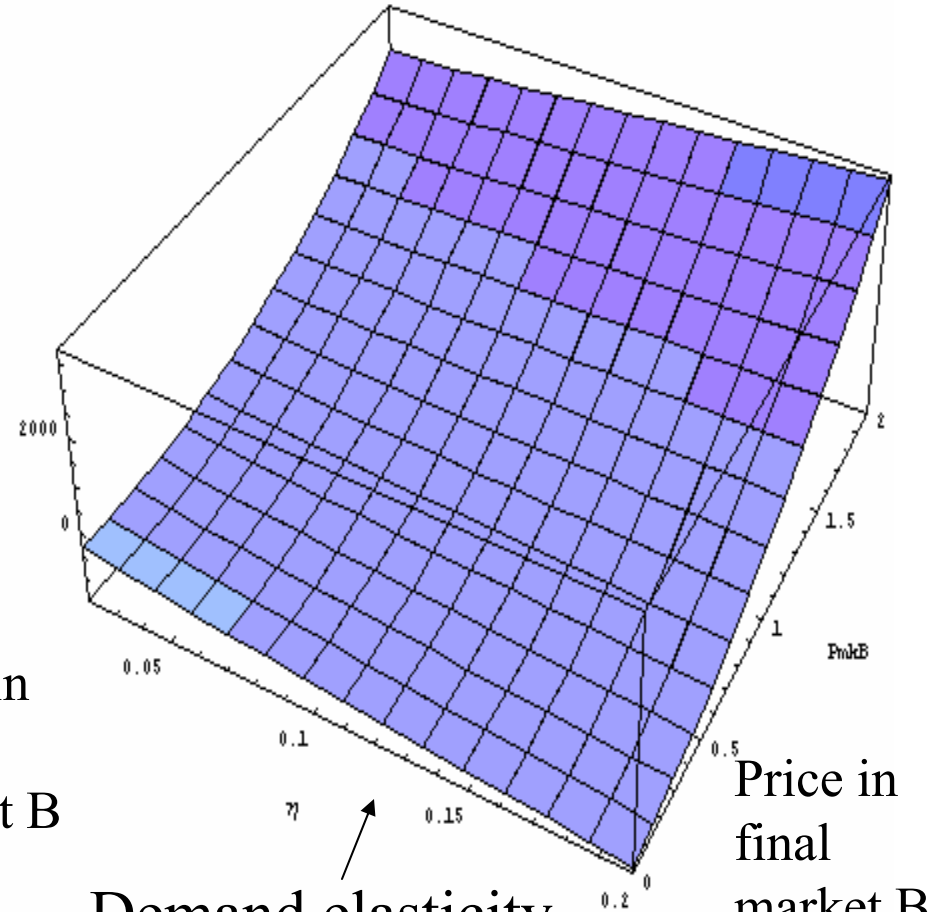
Profits sensibility analysis

Incumbent



Demand elasticity

Follower



Demand elasticity

Price in final market B

Conclusions

- The incumbent undercutting strategy in the intermediate market produces a lower level of profits with respect to Bertrand competition and such gap is as much high as greater is the number of competitors.
- If the incumbent decides to allow the market entrance of a new carrier, an undercutting strategy in the final market carried out by the follower will be more reasonable as much high as great is the profits gap.
- This strategic option depends mainly to the interconnection cost level and so will be more feasible in the case of IP transmission technology.