$\xi \in \{A, B, \ldots\}$ SITUACIONES FACTIBLES:

$$\left(\sum_{i \in I} X_i^{\xi} \leq \text{DISPONIBLE} \right)$$

PASAR DE A a B ES UN MEJORAMIENTO DE PARETO $\Leftrightarrow \begin{cases} \exists i \in I : X_i^A < X_i^B \\ \forall i \in I : X_i^A \leq X_i^B \end{cases}$

A ES UN ÓPTIMO DE PARETO $\Leftrightarrow \forall \xi$ FACTIBLE

ξ NO ES MEJORAMIENTO PARETO RESP. A

PRIMER TEOREMA BIENESTAR

ANTES: EQUILIBRIO WALRASIANO

$$(x_1^*, x_2^*, \dots, x_I^*, y_1^*, \dots, y_J^*, p^*)$$

$\Longleftrightarrow$ ① $\forall j \in J$: $y_j^* p^* \geq y_j p^* \quad \forall y_j \in Y_j$

② $x_i^* \succeq x_i \quad \forall x_i$: $p^* x_i \leq p^* \omega_i + \sum_j \theta_{ij} p^* y_j^*$

$$p^* x_i^* \leq p^* \omega_i + \sum_j \theta_{ij} p^* y_j^*$$

③ $$\sum_i x_i^* = \sum_j y_j^* + \sum_i \omega_i$$

EJEMPLO

4 AGENTES $\{1, 2, 3, 4\} = I$ $(\mu_1, \mu_2, \mu_3, \mu_4)$

OPCIONES FACTIBLES: $A = (5, 1, 1, 1)$

$B = (6, 2, 2, 1)$

$C = (3, 1, 1, 5)$

$D = (2, 2, 1, 5)$

INICIAL FINAL

	A	B	C	D
A	X	✓	X	X
B	X	X	X	X
C			X	
D				X

OLIGOPOLIO:

1. COURNOT (q)
2. BERTRAND (p)
3. STACKELBERG (L, S)

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1. J PRODUCTORES:

$$\forall j \in J: \quad \max_{\{q_j\}} P\Big(q_j + \sum_{\ell \neq j} q_\ell\Big) q_j - c \cdot q_j$$

C.P.O. $\quad P\Big(q_j + \sum_{\ell \neq j} q_\ell\Big) + P'\Big(q_j + \sum_{\ell \neq j} q_\ell\Big) q_j = c$

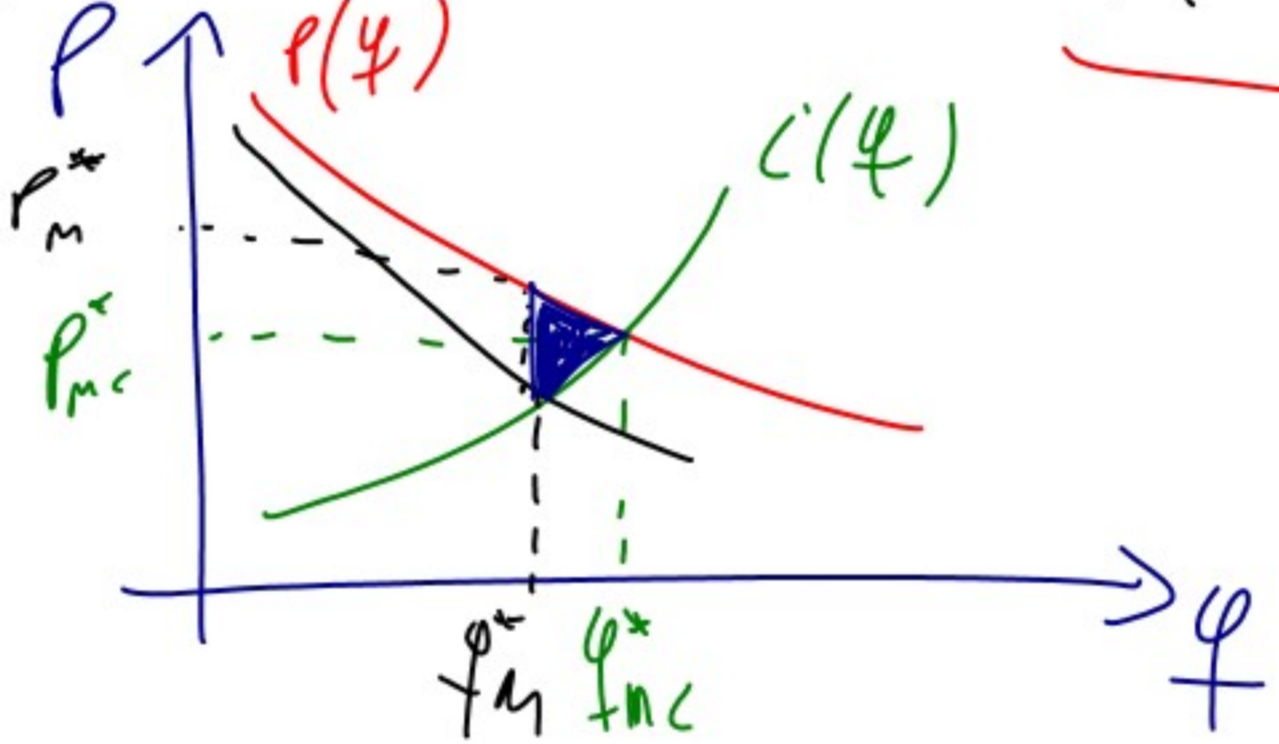
PODER DE MERCADO

$$\max_{\{q\}} \; \overset{\frown}{\bar{p}} \cdot q - c(q)$$

$$p = c'(q)$$

$$\max_{\{q\}} \; \overset{\frown}{p(q)} \cdot q - c(q)$$

$$\underbrace{\overset{(-)}{p'(q)}\,q} + p(q) = c'(q)$$



$$P\Big(q_i + \sum_{\ell \neq i} q_\ell\Big) + P'\Big(q_i + \sum_{\ell \neq i} q_\ell\Big) q_i = c$$

$$P\Big(q_1 + \sum_{\ell \neq 1} q_\ell\Big) + P'\Big(q_1 + \sum_{\ell \neq 1} q_\ell\Big) q_1 = c$$

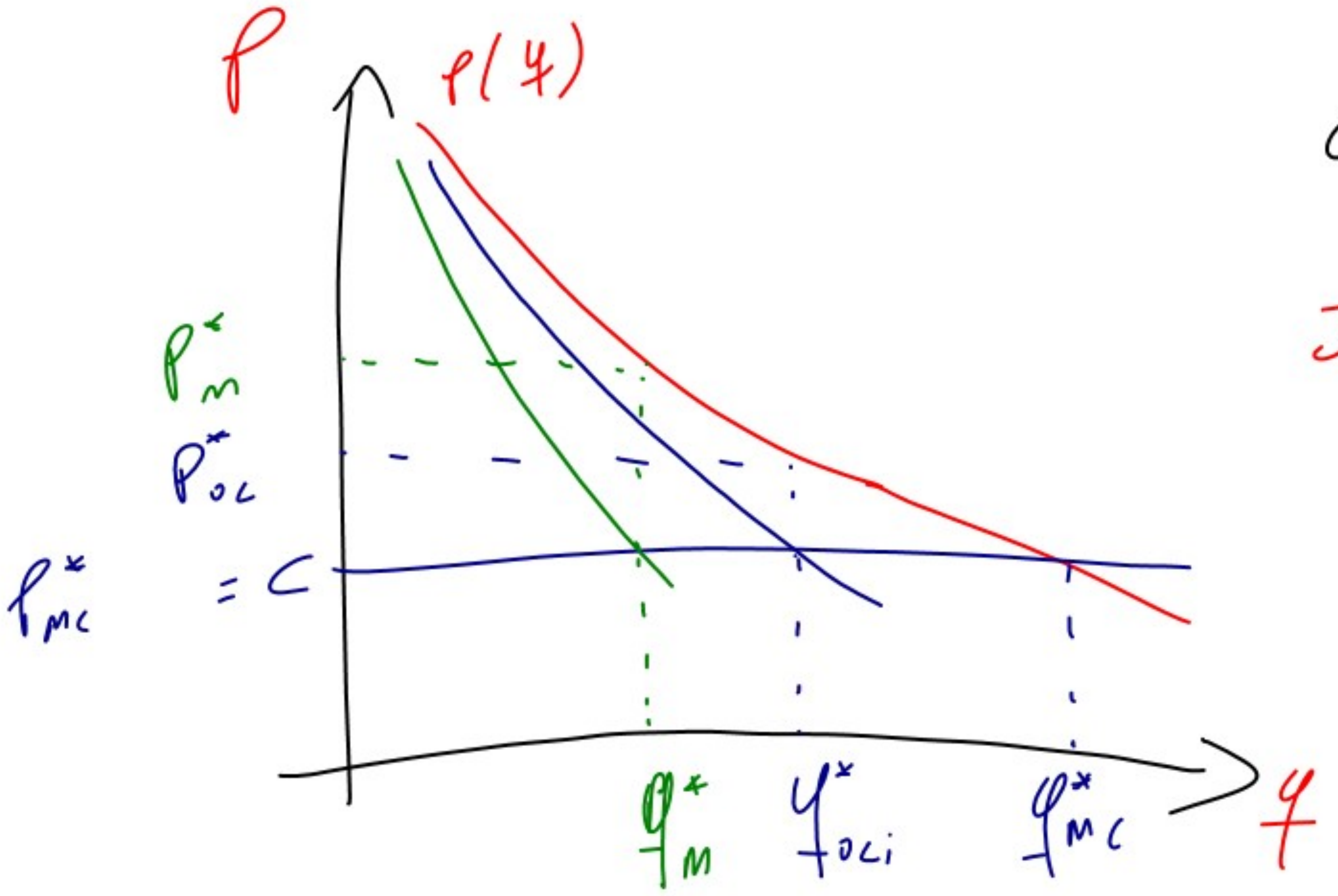
$$P\Big(q_2 + \sum_{\ell \neq i} q_\ell\Big) + P'\Big(q_2 + \sum_{\ell \neq i} q_\ell\Big) q_2 = c$$

$$\vdots$$

$$P\Big(q_J + \sum_{\ell \neq i} q_\ell\Big) + P'\Big(q_J + \sum_{\ell \neq i} q_\ell\Big) q_J = c$$

$$J \cdot c = J\, P\Big(\sum_\ell q_\ell\Big) + P'\Big(\sum_\ell q_\ell\Big)\Big(\sum_\ell q_\ell\Big)$$

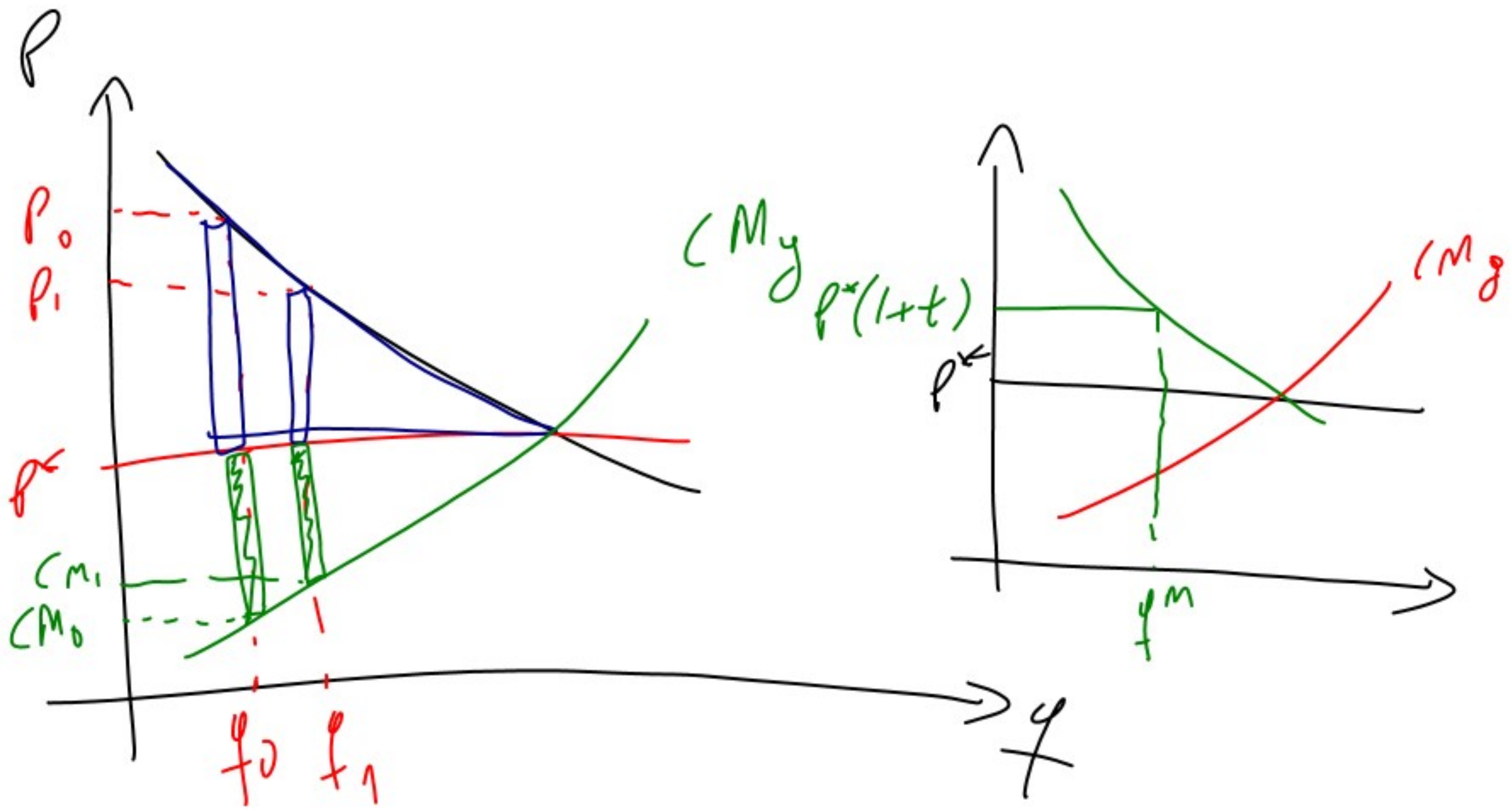
$$c = P\Big(\sum_\ell q_\ell\Big) + \underbrace{P'\Big(\sum_\ell q_\ell\Big)\left(\frac{\sum_\ell q_\ell}{J}\right)}$$



$$C = P(Q^*) + P'(Q^*)\frac{Q^*}{J}$$

$J \to \infty$

$$\boxed{C = P(Q^*)}$$



p
p_0
p_1
p^*
CM_1
CM_0
q_0
q_1
q
CM_y
$p^*(1+t)$
p^*
CM_g
q^M