LISTA II MICROECONOMIA II

2013/2º

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EXERCÍCIO 5.12 (ADVANCED MICROECONOMIC THEORY PAGE 253)

5.12.A * DEMANDAS MARSHALLIANAS

CONSUMIDOR 1

CONSIDERANDO $X_1 = X_2$, POIS TRATA-SE DE UMA FUNÇÃO LEONTIEF, TEM-SE QUE

$$P_1 X_1^1 + P_2 X_2^1 = Y^1$$

$$P_1 X_2^1 + P_2 X_2^1 = Y^1$$

$$(P_1 + P_2) X_2^1 = Y^1$$

$$\boxed{X_2^1 = \frac{Y^1}{P_1 + P_2}} \qquad (1)$$

COMO $X_1 = X_2$, ENTÃO

$$\boxed{X_1^1 = \frac{Y^1}{P_1 + P_2}} \qquad (2)$$

CONSUMIDOR 2

RECUPERANDO AS DEMANDAS MARSHALLIANAS ATRAVÉS DA IDENTIDADE DE ROY

$$V^2 = \frac{Y^2}{2(P_1 \cdot P_2)^{1/2}}$$

$$X_1^2 = -\frac{\partial V^2 / \partial P_1}{\partial V^2 / \partial Y^2}$$

$$= -\frac{-1/2\, Y^2 / 2 P_1^{3/2} \cdot P_2^{1/2}}{1/2 P_1^{1/2} \cdot P_2^{1/2}}$$

$$= \frac{1/2\, Y^2}{2 P_1^{3/2} \cdot \cancel{P_2^{1/2}}} \cdot 2 \cdot P_1^{1/2} \cdot \cancel{P_2^{1/2}}$$

$$\boxed{x_1^2 = \frac{Y^2}{2P_1}} \qquad (3)$$

1.A

$$x_2^2 = -\frac{\partial v^2/\partial P_2}{\partial v^2/\partial Y^2}$$

$$= -\frac{-\frac{1}{2}Y^2/2P_1^{1/2}.P_2^{3/2}}{1/2P_1^{1/2}.P_2^{1/2}}$$

$$= \frac{\frac{1}{2}Y^2}{2\cancel{P_1^{1/2}}.P_2^{3/2}} . 2.\cancel{P_1^{1/2}}.P_2^{1/2}$$

$$\boxed{= \frac{Y^2}{2P_2}} \qquad (4)$$

* EXCESSOS DE DEMANDA

$$Z_1(P) = \Sigma x_1^i - \Sigma e_1^i$$

$$= \frac{Y^1}{P_1+P_2} + \frac{Y^2}{2P_1} - 30 - 0$$

$$= \frac{30P_1}{P_1+P_2} + \frac{{}^{10}\cancel{20}P_2}{{}_{1}\cancel{2}P_1} - 30$$

$$\boxed{= \frac{30P_1}{P_1+P_2} + \frac{10P_2}{P_1} - 30} \qquad (5)$$

$$Z_2(P) = \Sigma x_2^i - \Sigma e_2^i$$

$$= \frac{Y^1}{P_1+P_2} + \frac{Y^2}{2P_2} - 0 - 20$$

$$Z_2(P) = \frac{30P_1}{P_1+P_2} + \frac{\overset{10}{\cancel{20}}\cancel{P_2}}{1\cancel{2}\cancel{P_2}} - 20$$

$$= \frac{30P_1}{P_1+P_2} + 10 - 20$$

$$\boxed{= \frac{30P_1}{P_1+P_2} - 10} \qquad (6)$$

* FAZENDO $\underset{\sim}{P} = (1, P)$ E IGUALANDO (6) À ZERO

$$\frac{30P_1}{P_1+P_2} - 10 = 0$$

$$\frac{30(1)}{1+P} = 10$$

$$30 = 10 + 10P$$

$$10P = 20$$

$$\boxed{P^* = 2}$$

PORTANTO,

$$\frac{P_2}{P_1} = 2 \qquad \boxed{\underset{\sim}{P} = (1, 2)}$$

* ENCONTRANDO A WEA ASSOCIADA À $P^*$

$$x_1^1 = \frac{Y^1}{P_1+P_2}$$

$$= \frac{30P_1}{P_1+P_2}$$

$$= \frac{30(1)}{1+2}$$

$$x_1^1 = \frac{30}{3}$$

$$= 10 \quad \therefore \quad x_2^1 = 10$$

2.A

$$x_1^2 = \frac{Y^2}{2P_1} = \frac{{}^{10}\cancel{20}\,P_2}{{}_{1}\cancel{2}\,P_1} = \frac{10(2)}{1} = 20 \qquad\qquad x_2^2 = \frac{Y^2}{2P_2} = \frac{{}^{10}\cancel{20}\,\cancel{P_2}^{1}}{{}_{1}\cancel{2}\,\cancel{P_2}^{1}} = 10$$

$$\boxed{WEA = \{x_1^1, x_2^1, x_1^2, x_2^2 : (x_1^1, x_2^1) = (10, 10) \text{ e } (x_1^2, x_2^2) = (20, 10)\}}$$

5.12.B

* EXCESSOS DE DEMANDA

$$z_1(P) = \sum x_1^i - \sum e_1^i$$

$$= \frac{Y^1}{P_1 + P_2} + \frac{Y^2}{2P_1} - 5 - 0$$

$$\boxed{= \frac{5P_1}{P_1 + P_2} + \frac{20P_2}{2P_1} - 5} \qquad (1)$$

$$z_2(P) = \sum x_2^i - \sum e_2^i$$

$$= \frac{Y^1}{P_1 + P_2} + \frac{Y^2}{2P_2} - 0 - 20$$

$$= \frac{5P_1}{P_1 + P_2} + \frac{{}^{10}\cancel{20}\,\cancel{P_2}^{1}}{{}_{1}\cancel{2}\,\cancel{P_2}^{1}} - 20$$

$$= \frac{5P_1}{P_1 + P_2} + 10 - 20 \longrightarrow \boxed{z_2(P) = \frac{5P_1}{P_1 + P_2} - 10}$$

(2)

* FAZENDO $\underset{\sim}{P} = (1, P)$ E IGUALANDO (2) À ZERO

$$\frac{5P_1}{P_1+P_2} - 10 = 0$$

$$\frac{5(1)}{1+P} = 10$$

$$5 = 10 + 10P$$

$$10P = -5$$

$$\boxed{P^* = -\frac{1}{2}}$$

UMA VEZ QUE O PREÇO DE EQUILÍBRIO ENCONTRADO É NEGATIVO IMPLICA QUE PARA ESSAS DOTAÇÕES NÃO É POSSÍVEL ENCONTRAR O EQUILÍBRIO WALRASIANO DA ECONOMIA.

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* DEMANDAS MARSHALLIANAS

CONSUMIDOR 1

$$x_1^1 = \frac{\alpha}{\cancel{\alpha}+1-\cancel{\alpha}} \cdot \frac{Y^1}{P_1} = \frac{\alpha \cdot Y^1}{P_1}$$

$$x_2^1 = \frac{1-\alpha}{\cancel{\alpha}+1-\cancel{\alpha}} \cdot \frac{Y^1}{P_2} = \frac{(1-\alpha) \cdot Y^1}{P_2}$$

(1) E (2)

CONSUMIDOR 2

$$x_1^2 = \frac{\alpha}{\cancel{\alpha}+1-\cancel{\alpha}} \cdot \frac{Y^2}{P_1} = \frac{\alpha \cdot Y^2}{P_1}$$

$$x_2^2 = \frac{1-\alpha}{\cancel{\alpha}+1-\cancel{\alpha}} \cdot \frac{Y^2}{P_2} = \frac{(1-\alpha) \cdot Y^2}{P_2}$$

(3) E (4)

* DEMANDAS NA WEA

3.A

$$\frac{\alpha \cdot Y^1}{P_1} = S \qquad \frac{(1-\alpha)\cdot Y^1}{P_2} = S \qquad (5) \text{ E } (6)$$

$$\frac{\alpha \cdot Y^2}{P_1} = S \qquad \frac{(1-\alpha)\cdot Y^2}{P_2} = S \qquad (7) \text{ E } (8)$$

* DESENVOLVENDO (5)

$$\frac{\alpha \cdot Y^1}{P_1} = S$$

$$\frac{\alpha \cdot (e^1_1 \cdot P_1 + e^1_2 \cdot P_2)}{P_1} = S$$

FAZENDO $\underset{\sim}{P} = (1, P)$ TEM-SE QUE

$$\frac{\alpha \cdot [e^1_1 (1) + e^1_2 \cdot P]}{1} = S \ \therefore \ \alpha \cdot e^1_1 + \alpha \cdot e^1_2 \cdot P = S \qquad (9)$$

* DESENVOLVENDO (7)

$$\frac{\alpha \cdot Y^2}{P_1} = S$$

$$\frac{\alpha \cdot (e^2_1 \cdot P_1 + e^2_2 \cdot P_2)}{P_1} = S$$

FAZENDO $\underset{\sim}{P} = (1, P)$ TEM-SE QUE

$$\frac{\alpha [e^2_1 (1) + e^2_2 \cdot P]}{1} = S \ \therefore \ \alpha \cdot e^2_1 + \alpha \cdot e^2_2 \cdot P = S \qquad (10)$$

* SOMANDO (9) E (10) TEM-SE QUE

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$$\alpha \cdot e_1^1 + \alpha \cdot e_2^1 \cdot p + \alpha \cdot e_1^2 + \alpha \cdot e_2^2 \cdot p = 5 + 5$$

$$(e_1^1 + e_1^2)\alpha + (e_2^1 + e_2^2)\alpha \cdot p = 10$$

$$e_1 \cdot \alpha + e_2 \cdot \alpha \cdot p = 10$$

$$10\alpha + 10\alpha p = 10 \quad \times (1/10) \qquad \text{pois } (e_1, e_2) = (10, 10)$$

$$\alpha + \alpha \cdot p = 1$$

$$\alpha \cdot p = 1 - \alpha$$

$$\boxed{p^* = \frac{1-\alpha}{\alpha}}$$

LOGO, $\underset{\sim}{p} = \left(1, \dfrac{1-\alpha}{\alpha}\right)$

* DE (5) SABE-SE QUE

$$\frac{\alpha(e_1^1 \cdot p_1 + e_2^1 \cdot p_2)}{p_1} = 5$$

$$\frac{\alpha\left[e_1^1(1) + e_2^1\left(\frac{1-\alpha}{\alpha}\right)\right]}{1} = 5$$

$$\alpha \cdot e_1^1 + (1-\alpha)e_2^1 = 5$$

$$(1-\alpha)e_2^1 = 5 - \alpha \cdot e_1^1$$

$$e_2^1 = \frac{5 - \alpha \cdot e_1^1}{1-\alpha} \qquad (11)$$

* SABE-SE QUE

(4.A)

$$e_1^1 + e_1^2 = 10 \qquad\qquad e_2^1 + e_2^2 = 10$$

$$e_1^2 = 10 - e_1^1 \qquad\qquad e_2^2 = 10 - e_2^1 \qquad\qquad (12) \text{ E } (13)$$

* SUBSTITUINDO (11) EM (13)

$$e_2^2 = 10 - \frac{5 - \alpha . e_1^1}{1-\alpha}$$

$$= \frac{10 - 10\alpha - 5 + \alpha . e_1^1}{1-\alpha}$$

$$= \frac{5 - 10\alpha + \alpha . e_1^1}{1-\alpha}$$

* INTERVALOS

$$0 \leq e_1^1 \leq 10 \qquad\qquad 0 \leq e_2^1 \leq 10 \qquad\qquad (14) \text{ E } (15)$$

* SUBSTITUINDO (11) EM (15)

$$0 \leq \frac{5 - \alpha . e_1^1}{1-\alpha} \leq 10$$

$$\frac{5 - \alpha . e_1^1}{1-\alpha} \geq 0$$

$$5 - \alpha . e_1^1 \geq 0$$

$$-\alpha . e_1^1 \geq -5$$

$$e_1^1 \leq \frac{5}{\alpha}$$

$$\frac{5 - \alpha . e_1^1}{1-\alpha} \leq 10$$

$$5 - \alpha . e_1^1 \leq 10 - 10\alpha$$

$$-\alpha . e_1^1 \leq 5 - 10\alpha$$

$$\alpha . e_1^1 \geq 10\alpha - 5$$

$$e_1^1 \geq 10 - \frac{5}{\alpha}$$

PORTANTO,

$$10 - \frac{5}{a} \leq e_1^1 \leq \frac{5}{a}$$

MAS UMA VEZ QUE $0 \leq e_1^1 \leq 10$ TEM-SE QUE

$$\boxed{\max\left(0, 10 - \frac{5}{a}\right) \leq e_1^1 \leq \min\left(10, \frac{5}{a}\right) ;\ e_1^1 \neq 5}$$

EXERCÍCIO 5.18 (ADVANCED MICROECONOMIC THEORY PAGE 254)

5.18.A $\quad u^2 = \dfrac{8.000}{27}$

$$= \left(\frac{20}{3}\right)^3$$

TODAVIA,

$$u^2(x_1, x_2) = (x_1)^2 . x_2$$

ENTÃO,

$$u^2(x_1, x_2) = \left(\frac{20}{3}\right)^2 . \frac{20}{3}$$

DESSA FORMA,

$$(x_1^2, x_2^2) = \left(\frac{20}{3}, \frac{20}{3}\right)$$

* DOTAÇÕES DO CONSUMIDOR 1

COMO AS DOTAÇÕES TOTAIS SÃO: $(x_1^T, x_2^T) = (10, 20)$, ENTÃO:

(5.1)

$$x_1^1 = x_1^T - x_1^2$$
$$= 10 - \frac{20}{3}$$
$$= \frac{30-20}{3}$$
$$= \frac{10}{3}$$

$$x_2^1 = x_2^T - x_2^2$$
$$= 20 - \frac{20}{3}$$
$$= \frac{60-20}{3}$$
$$= \frac{40}{3}$$

SENDO ASSIM,

$$(x_1^1, x_2^1) = \left(\frac{10}{3}, \frac{40}{3}\right)$$

* PARETO EFICIENTE

$$TMS^1 = TMS^2$$

CONSUMIDOR 1

$$UMg_1^1 = \frac{\partial u^1}{\partial x_1^1}$$
$$= (x_2^1)^2$$

$$UMg_2^1 = \frac{\partial u^1}{\partial x_2^1}$$
$$= 2x_1^1 \cdot x_2^1$$

$$TMS^1 = \frac{UMg_1^1}{UMg_2^1}$$
$$= \frac{(x_2^1)^{\cancel{2}}}{2x_1^1 \cdot \cancel{x_2^1}}$$
$$= \frac{x_2^1}{2x_1^1}$$
$$= \frac{40/\cancel{3}}{2 \cdot 10/\cancel{3}}$$

$$TMS^1 = \frac{\cancel{40}^{2}}{\cancel{20}^{1}}$$

$$\boxed{= 2}$$

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## CONSUMIDOR 2

$$UMg_1^2 = \frac{\partial u^2}{\partial x_1^2} = 2\,x_1^2\,x_2^2$$

$$UMg_2^2 = \frac{\partial u^2}{\partial x_2^2} = (x_1^2)^2$$

$$TMS^2 = \frac{UMg_1^2}{UMg_2^2} = \frac{2\,\cancel{x_1^2}\cdot x_2^2}{(x_1^2)^{\cancel{2}}} = \frac{2\,x_2^2}{x_1^2} = \frac{2\cdot\cancel{\frac{20}{3}}}{\cancel{20/3}}$$

$$\boxed{TMS^2 = 2}$$

DESSA FORMA,

$$\boxed{TMS^1 = TMS^2 = 2} \quad \blacksquare$$

$$\boxed{WEA = \left\{x_1^1, x_2^1, x_1^2, x_2^2 : (x_1^1, x_2^1) = \left(\frac{10}{3}, \frac{40}{3}\right) \text{ E } (x_1^2, x_2^2) = \left(\frac{20}{3}, \frac{20}{3}\right)\right\}}$$

5.18.B * DEMANDAS MARSHALLIANAS

## CONSUMIDOR 1

$$x_1^1 = \frac{1}{1+2}\cdot\frac{Y^1}{P_1} = \frac{Y^1}{3P_1}$$

$$x_2^1 = \frac{2}{1+2}\cdot\frac{Y^1}{P_2} = \frac{2Y^1}{3P_2}$$

CONSUMIDOR 2

6.A

$$x_1^2 = \frac{2}{1+2} \cdot \frac{Y^2}{P_1} \qquad x_2^2 = \frac{1}{1+2} \cdot \frac{Y^2}{P_2}$$

$$= \frac{2Y^2}{3P_1} \qquad = \frac{Y^2}{3P_2}$$

* EXCESSOS DE DEMANDAS

$$Z_1(P) = \Sigma x_1^i - \Sigma e_1^i$$

$$= \frac{Y^1}{3P_1} + \frac{2Y^2}{3P_1} - 10 - 0$$

$$= \frac{10\cancel{P_1}}{3\cancel{P_1}} + \frac{2.(20P_2)}{3P_1} - 10$$

$$= \frac{10}{3} + \frac{40P_2}{3P_1} - 10$$

$$\boxed{= \frac{40P_2}{3P_1} - \frac{20}{3}} \qquad (1)$$

$$Z_2(P) = \Sigma x_2^i - \Sigma e_2^i$$

$$= \frac{2Y^1}{3P_2} + \frac{Y^2}{3P_2} - 0 - 20$$

$$= \frac{2(10P_1)}{3P_2} + \frac{20\cancel{P_2}}{3\cancel{P_2}} - 20$$

$$= \frac{20P_1}{3P_2} + \frac{20}{3} - 20$$

$$\boxed{Z_2(P) = \frac{20P_1}{3P_2} - \frac{40}{3}} \qquad (2)$$

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NÃO HÁ NADA AQUI

FOI ERRO MEU

* FAZENDO $\underset{\sim}{P} = (1, P)$ E IGUALANDO (2) À ZERO

(17.A)

$$\frac{20P_1}{3P_2} - \frac{40}{3} = 0$$

$$\frac{20(1)}{3P} = \frac{40}{3}$$

$$\frac{\cancel{20}^{1}}{{}^{1}\cancel{3}P} = \frac{\cancel{40}^{2}}{\cancel{3}_{1}} \rightarrow 2P = 1$$

$$\boxed{P^* = \frac{1}{2}}$$

PORTANTO,

$$\underset{\sim}{P} = \left(1, \frac{1}{2}\right)$$

* ENCONTRANDO A WEA ASSOCIADA À $P^*$

$$x_1^1 = \frac{Y^1}{3P_1} = \frac{10\cancel{P_1}}{3\cancel{P_1}} = \frac{10}{3}$$

$$x_2^1 = \frac{2Y^1}{3P_2} = \frac{2(10P_1)}{3P_2} = \frac{20(1)}{3(1/2)} \rightarrow x_2^1 = \frac{20}{3/2} = \frac{40}{3}$$

$$x_1^2 = \frac{2Y^2}{3P_1} = \frac{2(20P_2)}{3P_1} = \frac{40P_2}{3P_1} \rightarrow x_1^2 = \frac{40(1/2)}{3(1)} = \frac{20}{3}$$

$$x_2^2 = \frac{Y^2}{3P_2} = \frac{20\cancel{P_2}}{3\cancel{P_2}} = \frac{20}{3}$$

# LISTA IV MICROECONOMIA II

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P

$$\boxed{WEA = \left\{ x_1^1, x_2^1, x_1^2, x_2^2 : (x_1^1, x_2^1) = \left(\frac{10}{3}, \frac{40}{3}\right) \text{ e } (x_1^2, x_2^2) = \left(\frac{20}{3}, \frac{20}{3}\right) \right\}}$$

**EXERCÍCIO 5.20** (ADVANCED MICROECONOMIC THEORY PAGE 254)

5.20.A

$$\frac{\partial u}{\partial x_1} = \alpha (x_1 - s_1)^{\alpha - 1}$$

$$\frac{\partial u}{\partial x_2} = \alpha (x_2 - s_2)^{\alpha - 1}$$

ENTÃO,

$$\frac{\partial u / \partial x_1}{\partial u / \partial x_2} = \frac{\cancel{\alpha} (x_1 - s_1)^{\alpha - 1}}{\cancel{\alpha} (x_2 - s_2)^{\alpha - 1}}$$

$$= \left( \frac{x_1 - s_1}{x_2 - s_2} \right)^{\alpha - 1}$$

COMO $(x_1, x_2) = (e_1, e_2)$, ENTÃO

$$\frac{\partial u / \partial x_1}{\partial u / \partial x_2} = \left( \frac{e_1 - s_1}{e_2 - s_2} \right)^{\alpha - 1}$$

PORTANTO,

$$\boxed{p^* = \left( \frac{e_1 - s_1}{e_2 - s_2} \right)^{\alpha - 1}}$$

(5.20.B) PROBLEMA DE MAXIMIZAÇÃO DA UTILIDADE - PMU: (P.A)

$$\max u\,(x_1-s_1)^a+(x_2-s_2)^a \quad s.\,a \quad p_1x_1+p_2x_2=m$$

MONTANDO A LAGRANGIANA

$$\mathcal{L}(x_1,x_2)=(x_1-s_1)^a+(x_2-s_2)^a+\lambda(m-p_1x_1-p_2x_2)$$

CONDIÇÕES DE PRIMEIRA ORDEM - CPO

$$\frac{\partial\mathcal{L}}{\partial x_1}=0 \therefore a(x_1-s_1)^{a-1}-\lambda p_1=0 \therefore \lambda=\frac{a(x_1-s_1)^{a-1}}{p_1} \qquad (1)$$

$$\frac{\partial\mathcal{L}}{\partial x_2}=0 \therefore a(x_2-s_2)^{a-1}-\lambda p_2=0 \therefore \lambda=\frac{a(x_2-s_2)^{a-1}}{p_2} \qquad (2)$$

$$\frac{\partial\mathcal{L}}{\partial\lambda}=0 \therefore m-p_1x_1-p_2x_2=0 \therefore m=p_1x_1+p_2x_2 \qquad (3)$$

* IGUALANDO (1) E (2)

$$\frac{\cancel{a}(x_1-s_1)^{a-1}}{p_1}=\frac{\cancel{a}(x_2-s_2)^{a-1}}{p_2}$$

$$(x_1-s_1)^{a-1}=\frac{p_1}{p_2}(x_2-s_2)^{a-1}$$

$$x_1-s_1=(x_2-s_2)\left(\frac{p_1}{p_2}\right)^{\frac{1}{a-1}}$$

$$x_1=(x_2-s_2)\left(\frac{p_1}{p_2}\right)^{\frac{1}{a-1}}+s_1 \qquad (4)$$

* SUBSTITUINDO (4) EM (3), OU SEJA, NA RESTRIÇÃO

$$m=p_1\left[(x_2-s_2)\left(\frac{p_1}{p_2}\right)^{\frac{1}{a-1}}+s_1\right]+p_2x_2$$

$$=(x_2-s_2)\frac{p_1^{\frac{a}{a-1}}}{p_2^{\frac{1}{a-1}}}+p_1s_1+p_2x_2$$

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CONSIDERANDO $\delta = \frac{1}{\sigma - 1}$ E $\delta + 1 = \frac{\sigma}{\sigma - 1}$, ENTÃO:

$$m = (x_2 - S_2)\frac{P_1^{\delta+1}}{P_2^{\delta}} + P_1 S_1 + P_2 x_2$$

$$= \frac{P_1^{\delta+1}}{P_2^{\delta}} x_2 - \frac{P_1^{\delta+1}}{P_2^{\delta}} S_2 + P_1 S_1 + P_2 x_2$$

$$= \left(\frac{P_1^{\delta+1}}{P_2^{\delta}} + P_2\right) x_2 - \frac{P_1^{\delta+1}}{P_2^{\delta}} S_2 + P_1 S_1$$

$$\left(\frac{P_1^{\delta+1} + P_2^{\delta+1}}{P_2}\right) x_2 = m + \frac{P_1^{\delta+1}}{P_2^{\delta}} S_2 - P_1 S_1$$

$$x_2 = \left(\frac{P_2^{\delta}}{P_1^{\delta+1} + P_2^{\delta+1}}\right) \cdot \left(m + \frac{P_1^{\delta+1}}{P_2^{\delta}} S_2 - P_1 S_1\right)$$

$$\boxed{= \frac{m P_2^{\delta} + P_1^{\delta+1} S_2 - P_1 P_2^{\delta} S_1}{P_1^{\delta+1} + P_2^{\delta+1}}} \; //$$

PORTANTO,

$$x_2^i = \frac{m P_2^{\delta} + P_1^{\delta+1} S_2 - P_1 P_2^{\delta} S_1}{P_1^{\delta+1} + P_2^{\delta+1}}$$

\# EXCESSO DE DEMANDA

$$z_2(P) = \Sigma x_2^i - \Sigma e_2^i$$

MAS UMA VEZ QUE $Z_2(P)=0$ TEM-SE QUE

$$\Sigma x_2^i = \Sigma e_2^i$$

$$x_2^1 + x_2^2 = e_2^1 + e_2^2$$

$$x_2 = e_2$$

$$\frac{(P_1 e_1 + P_2 e_2) P_2^{\gamma} + P_1^{\gamma+1} S_2 - P_1 P_2^{\gamma} S_1}{P_1^{\gamma+1} + P_2^{\gamma+1}} = e_2$$

$$P_1 P_2^{\gamma} e_1 + \cancel{P_2^{\gamma+1}} e_2 + P_1^{\gamma+1} S_2 - P_1 P_2^{\gamma} S_1 = P_1^{\gamma+1} e_2 + \cancel{P_2^{\gamma+1}} e_2$$

$$\boxed{P_1 P_2^{\gamma} e_1 + P_1^{\gamma+1} S_2 - P_1 P_2^{\gamma} S_1 = P_1^{\gamma+1} e_2} \quad (1)$$

COMO $P_1 = 1$ TEM-SE

$$P_2^{\gamma} e_1 + S_2 - P_2^{\gamma} S_1 = e_2$$

$$P_2^{\gamma} e_1 - P_2^{\gamma} S_1 = e_2 - S_2$$

$$(e_1 - S_1) P_2^{\gamma} = e_2 - S_2$$

$$P_2^{\gamma} = \frac{e_2 - S_2}{e_1 - S_1}$$

$$\boxed{P_2 = \left(\frac{e_2 - S_2}{e_1 - S_1}\right)^{1/\gamma}} \quad (2)$$

* CONSIDERANDO $\underset{\sim}{P} = \left[1, \left(\frac{e_2 - S_2}{e_1 - S_1}\right)^{1/\gamma}\right]$ E SUBSTITUINDO EM (1)

$$\left(\frac{e_2 - S_2}{e_1 - S_1}\right) e_1 + S_2 - \left(\frac{e_2 - S_2}{e_1 - S_1}\right) S_1 = e_2$$

$$\left(\frac{e_2 - S_2}{\cancel{e_1 - S_1}}\right) \cdot \cancel{(e_1 - S_1)} + S_2 = e_2$$

$$e_2 - \cancel{s_2} + \cancel{s_2} = e_2 \quad \therefore \quad \boxed{e_2 = e_2}$$

PORTANTO,

$$p^* = \left(\frac{e_2 - s_2}{e_1 - s_1}\right)^{\frac{1}{\gamma}}$$

$$\boxed{= \left(\frac{e_2 - s_2}{e_1 - s_1}\right)^{q-1}} \qquad \text{pois } \gamma = \frac{1}{q-1} \qquad (3)$$

SENDO ASSIM, (3) É O PREÇO RELATIVO DE EQUILÍBRIO DA ECONOMIA.

10.A