

Exercises for CGE Modeling

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Model 1: Basic

- Assumptions:
 - A Cobb-Douglas production function
 - A closed economy
 - 2 factors of production
 - 1 good
 - No savings
 - Equilibrium in labor, capital and goods market

$$Y = AK^\alpha L^{1-\alpha} \quad (1)$$

$$wL = (1 - \alpha)PY \quad (2)$$

$$rK = \alpha PY \quad (3)$$

$$Rev = wL^S + rK^S \quad (4)$$

$$PC = Rev \quad (5)$$

$$Y = C \quad (6)$$

$$L = L^S \quad (7)$$

$$K = K^S \quad (8)$$

Model 2: Simple

- Assumptions:
 - A Cobb-Douglas production function
 - A closed economy
 - 2 factors of production
 - 2 goods
 - Perfect mobility of L and K between sectors
 - One rent and one wage
 - No savings
 - Equilibrium in labor, capital and goods market

$$Y_i = A_i K_i^{\alpha_i} L_i^{1-\alpha_i} \quad (1)$$

$$wL_i = (1 - \alpha_i) P_i Y_i \quad (2)$$

$$rK_i = \alpha_i P_i Y_i \quad (3)$$

$$\text{Rev} = wL^S + rK^S \quad (4)$$

$$P_i C_i = \beta_i \text{Rev} \quad (5)$$

$$Y_i = C_i \quad (6)$$

$$L^S = \sum L_i \quad (7)$$

$$K^S = \sum K_i \quad (8)$$

Model 3: Open-economy

- Assumptions:
 - A Cobb-Douglas production function
 - An open economy with government
 - 2 factors of production
 - 2 goods
 - Perfect mobility of L and K between sectors
 - One rent and one wage
 - No savings
 - Equilibrium in labor, capital and goods market
 - Government
 - Trade balance

$$Y = A K^\alpha L^{1-\alpha}$$

$$W_L L = (1 - \alpha) P Y$$

$$W_K K = (\alpha) P Y$$

$$Rev = W_L L + W_K K + \text{customs} + \text{taxes}$$

$$P_{C_i} C_i = \beta_i Rev$$

$$Y = D + X$$

$$L^S = \sum L_i$$

$$K^S = \sum K_i$$

$$D = a_D C \left(\frac{P_C}{P} \right)^\sigma$$

$$M = a_M C \left(\frac{P_C}{P_m} \right)^\sigma$$

$$P_{Di} = P_i (1 + tx)$$

$$P_{Ci} C_i = P_{Di} D_i + P_{Mi} M_i$$

$$P_M = P_M^{World} (1 + dd)$$

$$X = \gamma_i \left(\frac{P_M^{World}}{P_i} / (1 + ddx) \right)^{\sigma x}$$

$$\sum P_i X_i = \sum P_M^{World} M_i$$

Thanks for your attention