

Session 4. General equilibrium trade analysis, continued

4. General equilibrium trade modeling: Heckscher-Ohlin-Samuelson (H-O-S) 2 x 2 x 2 trade model

4.1 Model specifications and assumptions of the model

4.1.1 Model specifications

- [1] 2 countries: North (N) and South (S)
- [2] 2 goods: agriculture (A) and manufacturing (M)
- [3] 2 factors: labor (L) and capital (K)

4.1.2 Assumptions of the model

- [1] Identical goods and factors
- [2] Competitive markets in goods and factors
- [3] Perfect mobility of the factors between the two sectors
- [4] Immobility of the factors across national borders
- [5] No transactions/transportation costs
- [6] No government intervention
- [7] Countries have different labor and capital endowment
- [8] Same technology: production functions same
- [9] Factor intensity in production: agriculture is L-intensive; manufacture is K-intensive
- [10] Full employment and no savings
- [11] Preferences may or may not be identical across countries

4.2 Implication of factor endowment differences

4.2.1 South has more L: $[L_0]_S > [L_0]_N$ implies $[P_L]_S < [P_L]_N$

4.2.2 North has more K: $[K_0]_N > [K_0]_S$ implies $[P_K]_N < [P_K]_S$

4.2.3 Relative factor prices: $[P_L/P_K]_N > [P_L/P_K]_S$

4.3 Identical production technology

4.3.1 Production functions: $Q_A = f(L_A, K_A)$ and $Q_M = g(L_M, K_M)$

4.3.2 Marginal product (MP) of factors: $\partial Q_A/\partial L_A, \partial Q_A/\partial K_A, \partial Q_M/\partial L_M, \partial Q_M/\partial K_M > 0$

4.3.3 Decreasing MP of factors: $\partial^2 Q_A/\partial L_A^2, \partial^2 Q_A/\partial K_A^2, \partial^2 Q_M/\partial L_M^2, \partial^2 Q_M/\partial K_M^2 < 0$

4.4 Factor intensity

4.4.1 L-intensity in A-production: $[P_L]_S < [P_L]_N$ implies $[P_A]_S < [P_A]_N$

4.4.2 K-intensity in M-production: $[P_K]_N < [P_K]_S$ implies $[P_M]_N < [P_M]_S$

4.4.3 Relative prices of goods: $[P_A/P_M]_S < [P_A/P_M]_N$

4.5 Full employment

4.5.1 $[L_0] = [L_A]_0 + [L_M]_0$

4.5.2 $[K_0] = [K_A]_0 + [K_M]_0$

4.6 Pre-trade general equilibrium: graphical representation

4.6.1 Production, Q_0 : $[Q_A]_0, [Q_M]_0$

4.6.2 Consumption, C_0 : $[C_A]_0, [C_M]_0$

4.6.3 Production = consumption: $Q_0 = C_0$

4.6.4 Pre-trade prices: $[P_A/P_M]_{PT}$

4.6.5 Social welfare (SW): utility maximization

4.7 Efficiency in production: general equilibrium analysis

4.7.1 Isoquant: $[Q_A]_0 = f([L_A]_0, [K_A]_0)$; $[Q_M]_0 = g([L_M]_0, [K_M]_0)$

4.7.2 Isocost: $C = P_L \cdot L_A + P_K \cdot K_A$; $C = P_L \cdot L_M + P_K \cdot K_M$

4.7.3 Efficiency in resource allocation across sectors

4.7.4 Production efficiency locus: efficient production mix

4.8 Efficiency in consumption: general equilibrium analysis

4.8.1 Utility

4.8.2 Budget constraint

4.8.3 Social welfare curve

4.9 H-O-S model of trade: from pre-trade to free trade

4.9.1 Implications of large country

4.9.2 Implications of non-identical preferences

