

Factor Content of Trade (i indexes countries)

$$A_i T_i = A_i Q_i - A_i C_i$$

Full Employment

$$A_i Q_i = v_i$$

Assumptions

1. All individuals face the same commodity prices
2. Individuals have identical and homothetic tastes
3. All countries have the same factor input matrix A.

Thus

$$C = s Q_W$$

$$B_i = p' T_i = p' Q_i - p' C_i = GDP_i - s(GDP_W)$$

$$s_i = (GDP_i - B_i) / GDP_W$$

$$A_i T_i = A_i Q_i - A_i C_i = v_i - s v_W = v_i - \left(\frac{GDP_i - B_i}{GDP_W} \right) v_W$$

$$F_{ki}^A = F_{ki} - v_{kw} B_i / GDP_W$$

$$\frac{F_{ki}^A / v_{kw}}{GDP_i / GDP_W} = \frac{v_{ki} / v_{kw}}{GDP_i / GDP_W} - 1$$

Alternative Hypotheses

A2 All individuals have identical preferences with linear Engle curves; within each country income is equally distributed.

Consumption of country i of commodity j:

$$C_{ij} = \lambda_j L_j + \psi_j (GDP_i - B_i - L_i \sum \lambda_j)$$

where λ is the per capita “autonomous expenditure) and ψ is the marginal budget share.

After manipulation this produces

$$F_i = v_i - \theta L_i - \beta (GDP_i - B_i)$$

MEASUREMENT ERRORS

$$\hat{T}_i = \omega + T_i + \varepsilon_i$$

$$v_{ki} = \gamma_k \hat{v}_{ki}$$

$$v_{kW} = \sigma_{kS} v_{kS}$$

$$GDP_W = \varphi_S GDP_S \quad (\text{S is the observed subset of countries})$$

(M1) $\omega = 0$

(M2) $\gamma_k = 1$ for all k.

(M3) $\sigma_{kS} = 1$ for all k and $\varphi_S = 1$.

TECHNOLOGICAL DIFFERENCES

$$A_{US} = \delta_i A_i$$

$$\hat{F}_{ki} = \alpha_k + (\delta_i \gamma_k) v_{ki} - \theta_k L_i - \beta_k (GDP_i - B_i) + \varepsilon_i^F$$