ZERO PROFIT CONDITION

\[ P_i = \sum_k A_{ik} w_k \]

\[ dp_i = \sum_k (A_{ik} dw_k + dA_{ik} w_k) . \]

Using the usual notation \( \hat{x} = dx / x \) this can be written as

\[ \hat{p}_i = dp_i / p_i = \sum_k [(A_{ik} w_k / p_i)(dw_k / w_k) + dA_{ik} w_k / p_i] = \sum_k \theta_{ik} \hat{w}_k + \sum_k \theta_{ik} \hat{A}_{ik} . \]

Then the input intensity \( A_{ik} = \gamma_{ik} / Q_i \), can be differentiated to obtain

\[ \hat{A}_{ik} = \gamma_{ik} - \hat{Q}_i . \]

TFP GROWTH

\[ TFP_i = \hat{Q}_i - \sum_k \theta_{ik} \hat{w}_k = - \sum_k \theta_{ik} \hat{A}_{ik} . \]

EQUILIBRIUM CONDITION

\[ \hat{p}_i = \sum_k \theta_{ik} \hat{w}_k - TFP_i = \theta_i \hat{w} - TFP_i \]

SECOND ORDER EFFECTS

\[ dp_i = \sum_k (A_{ik} dw_k + dA_{ik} w_k + dw_k dA_{ik}) . \]

\[ \hat{p}_i = dp_i / p_i = \sum_k \theta_{ik} \hat{w}_k + \sum_k \theta_{ik} \hat{A}_{ik} + \sum_k [(A_{ik} w_k / p_i)(dA_{ik} / A_{ik})(dw_k / w_k)] . \]

\[ \hat{p}_i = \theta_i \hat{w} - TFP_i + \hat{A}_i diag(\theta_i) \hat{w} \]
DECOMPOSITION

\[ \hat{p}_i(t) + \hat{p}_i(g) = \theta_i \hat{w}(t) + \theta_i \hat{w}(g) - T\hat{F}P_i \]

where

\[ \hat{p}_i(t) = \theta_i \hat{w}(t) - T\hat{F}P_i \]
\[ \hat{p}_i(g) = \theta_i \hat{w}(g) \]
\[ \hat{p}_i = \hat{p}_i(t) + \hat{p}_i(g) \]

PASS-THROUGH

\[ \hat{p}_i(t) = -\lambda T\hat{F}P_i \]

RESIDUAL “GLOBALIZATION” EFFECT

\[ \hat{p}_i(g) = \hat{p}_i - \hat{p}_i(t) \]

INTERMEDIATE INPUTS

**Zero profit identity:**

\[ \hat{p}_i = \theta_i'\hat{w} + \gamma_i'\hat{p} - T\hat{F}P_i \]

**Pass-Through Assumption:**

\[ \hat{p}_i(t) - \gamma_i'\hat{p}(t) = -\lambda T\hat{F}P_i \]

FIRST-ROUND ADJUSTMENTS

\[ \hat{p}_i(t) - \gamma_i'\{ -\lambda T\hat{F}P_i \} = -\lambda T\hat{F}P_i \]
09.3 Stolper-Samuelson accounting for prices

TECHNOLOGY EFFECT ON WAGES

\[-\lambda \ TFP_i = \theta_i \hat{w}(t) - TFP_i, \text{ or equivalently} \]

\[(1 - \lambda) TFP_i = \theta_i \hat{w}(t). \]

GLOBALIZATION EFFECT ON WAGES

\[\hat{p}(g) - \gamma_i' \hat{p}(g) = (\hat{p}_i - \gamma_i' \hat{p}) - (\hat{p}_i(t) - \gamma_i' \hat{p}(t)) = \hat{p}_i - \gamma_i' \hat{p} + \lambda \ TFP_i. \]

\[\hat{p}_i + \lambda \ TFP_i = \theta_i' \hat{w}(g) + \gamma_i' \hat{p} \]