# CPI Manual: Theory and Practice, *ILO, 2004*
# ERRATUM

Mathematical changes to the equations

## CHAPTER 1:

*Para 1.18, equation*

$$P_{Lo} \equiv \frac{\sum_{i=1}^{n} p_i^t q_i}{\sum_{i=1}^{n} p_i^0 q_i}$$

*Equation (1.15)*

$$P^r \equiv \frac{\sqrt[r]{\sum_{i=1}^{n} s_i^0 \left(\frac{p_i^t}{p_i^0}\right)^{r/2}}}{\sqrt[r]{\sum_{i=1}^{n} s_i^t \left(\frac{p_i^0}{p_i^t}\right)^{r/2}}}$$

## CHAPTER 15:

*Equation (15.28)*

$$s_i^{0b} \equiv \frac{p_i^0 q_i^b}{\sum_{j=1}^{n} p_j^0 q_j^b};$$

*Equation (15.29)*

$$= P_{Lo}(p^0, p^t, q^b)\left[\frac{\sum_{i=1}^{n} p_i^{t+1} q_i^b}{\sum_{i=1}^{n} p_i^t q_i^b}\right]$$

$$= P_{Lo}(p^0, p^t, q^b)\left[\frac{\sum_{i=1}^{n}\left(\frac{p_i^{t+1}}{p_i^t}\right) p_i^t q_i^b}{\sum_{i=1}^{n} p_i^t q_i^b}\right]$$

$$= P_{Lo}(p^0, p^t, q^b)\left[\sum_{i=1}^{n}\left(\frac{p_i^{t+1}}{p_i^t}\right) s_i^{tb}\right]$$

*Paragraph 15.60*

$$P_Y(p^t, p^0, s^b) = \sum_{i=1}^{n} s_i^b \left(p_i^0 / p_i^t\right)$$

*Equation (A15.2.4):*

$$= \frac{\sum_{i=1}^{n}(r_i - r^*) t_i s_i^0}{t^*} + \frac{r^*\left[\sum_{i=1}^{n} t_i s_i^0\right]}{t^*}$$

*Equation (A15.4.5)*

$$q_i(t) = u(t) c_i\left[p_1(t), p_2(t), ..., p_n(t)\right] \text{ for } i = 1, ..., n$$

*Equation (A15.4.6)*

$$\sum_{i=1}^{n} p_i(t) q_i(t) = u(t) c^*(t) = u(t) c\left[p_1(t), p_2(t), ..., p_n(t)\right].$$

*Equation (A15.4.7)*

$$= \frac{\sum_{i=1}^{n} p_i{}'(t)\left\{u(t) c\left[p_1(t), p_2(t), ..., p_n(t)\right]\right\}}{u(t) c^*(t)} \quad \text{using (A15.4.5)}$$

$$= \frac{\sum_{i=1}^{n} c_i\left[p_1(t), p_2(t), ..., p_n(t)\right] p_i{}'(t)}{c^*(t)} = \frac{1}{c^*(t)} \frac{dc^*(t)}{dt} \quad \text{using (A15.4.4)}$$

## CHAPTER 16.

*Footnote #43*

$$p_i^* \equiv \left[(1/2)p_i^0 + (1/2)p_i^1\right]/P_F\left(p^0 p^1 q^0 q^1\right)$$

*Equation (16.53)*

$$E[T] \equiv -\sum_{i=1}^{n} \rho_i r_i$$
$$= -\sum_{i=1}^{n} \rho_i t_i \quad \text{using (16.52)}$$

*Footnote #61*

$r_i \equiv p_i^1/p_i^0$

*Equation (A16.1.7)*

$$P^*(1,\ldots,1,r_i,1,\ldots,1;s^0,s^1) = f(1,r_i,s_i^0,s_i^1);$$

*Equation (A16.1.8)*

$$\ln P^*(1,\ldots,1,r_i,1,\ldots,1;s^0,s^1) = \ln f(1,r_i,s^0,s^1) = \alpha_i(s^0,s^1)\ln r_i;$$

## CHAPTER 17

*Equation (17.4)*

using the definition of the cost minimization problem that defines $C(f(q^0),p^0)$

$$\geq \frac{\sum_{i=1}^{n} p_i^1 q_i^1}{\sum_{i=1}^{n} p_i^0 q_i^1} \quad \text{since } q^1 \equiv (q_1^1,\ldots,q_n^1) \text{ is feasible for the minimization problem and thus}$$

$$C(f(q^1),p^0) \leq \sum_{i=1}^{n} p_i^0 q_i^1 \text{ and hence } \frac{1}{C(f(q^1),p^0)} \geq \frac{1}{\sum_{i=1}^{n} p_i^0 q_i^1}$$

$$= P_P(p^0,p^1,q^0,q^1)$$

*Paragraph 17.20 first equation*

$$Q(p^0,p^1,q^0,q^1) \equiv \frac{\sum_{i=1}^{n} p_i^1 q_i^1}{\sum_{i=1}^{n} p_i^0 q_i^0 P_K(p^0,p^1,q)}$$

*Equation (17.35)*

$$P^r(p^0, p^1, q^0, q^1) \equiv \frac{\sqrt[r]{\sum_{i=1}^{n} s_i^0 \left(\frac{p_i^1}{p_i^0}\right)^{r/2}}}{\sqrt[r]{\sum_{i=1}^{n} s_i^1 \left(\frac{p_i^1}{p_i^0}\right)^{-r/2}}}$$

*Equation (17.90)*

$$p_j^t = p_j^b + \alpha_j (M + t) \text{ for } j = 1,...,n$$

*Equation (17.99)*

$$= -\gamma \frac{\left\{\left[\sum_{i=1}^{n} \alpha_i q_i^b t\right] M^2 + 2\left[\sum_{i=1}^{n} p_i^b q_i^b\right] Mt + at^2\right\}}{\left\{a\left[a - \gamma M^2\right]\right\}}$$

**CHAPTER 18**

*Equation (18.11)*

$$S_h^t \equiv \frac{\sum_{i=1}^{n} p_{hi}^t q_{hi}^t}{\sum_{k=1}^{H} \sum_{i=1}^{n} p_{ki}^t q_{ki}^t} = \frac{p_h^t q_h^t}{\sum_{k=1}^{H} p_k^t q_k^t}$$

*Equation complex (18.18) –(18.20), third line.*

$$= \frac{1}{\sum_{h=1}^{H} \left(\frac{p_h^1 q_h^0}{p_h^0 q_h^0}\right)^{-1} S_h^1}$$

**CHAPTER 20**

*Footnote #27*:

$$w_i^0 \equiv p_i^0 \Big/ \sum_{j=1}^{n} p_j^0$$

*Equation (20.66)*

$\delta_m \equiv \ln \beta_m$ ; $m = 1,...,M.$

*Equation (20.72)*

$$\gamma^{**} \equiv \frac{\sum_{m=1}^{M} h\left(s_m^0, s_m^1\right) \ln \frac{p_m^1}{p_m^0}}{\sum_{m=1}^{M} h\left(s_m^0, s_m^1\right)}$$

**CHAPTER 22**

*Equation* (22.6):

$$= \sqrt{\sum_{n \in S(m)} s_n^{t,m} \left(p_n^{t+1,m} / p_n^{t,m}\right)} \sqrt{\left[\sum_{n \in S(m)} s_n^{t+1,m} \left(p_n^{t+1,m} / p_n^{t,m}\right)^{-1}\right]^{-1}}$$

*Equation (22.10):*

$$P_{AF}\left(p^{t,m}, p^{t+1,m}, s^{0,m}, s^{0,m}\right) \equiv \sqrt{P_{AL}\left(p^{t,m}, p_n^{t+1,m}, s^{0,m}\right) P_{AP}\left(p^{t,m}, p^{t+1,m}, s^{0,m}\right)}$$

$$= \sqrt{\sum_{n \in S(m)} s_n^{0,m} \left(p_n^{t+1,m} / p_n^{t,m}\right)^{-1}} \times \sqrt{\left[\sum_{n \in S(m)} s_n^{0,m} \left(p_n^{t+1,m} / p_n^{t,m}\right)^{-1}\right]^{-1}}$$

*Equation* (22.19):

$$\sigma_m^t = \frac{\sum_{n=S(m)} p_n^{t,m} q_n^{t,m}}{\sum_{i=1}^{12} \sum_{j \in S(i)} p_j^{t,i} p_j^{t,i}} \qquad m = 1,2,...,12;\ t = 0,1,...,T$$

**CHAPTER 23**

*Equation (23.70)*

$$R^0 \equiv V^0 (1 + r^0) + T_S^0 + T_L^0 - V^{1a}$$

*Equation (23.74)*

$$R^0 \equiv V^0(1+r^0)+T_S^0+T_L^0+C_S^0-V^{1a} \;=\; p_S^0Q_S^0+p_L^0Q_L^0$$

*Equation (23.75)*

$$p_S^0 \equiv [(1+r^0)-(1+i_S^0)(1-\delta_0)+\tau_S^0+\gamma_S^0]P_S^0$$
$$=[r^0-i_S^0+\delta_0(1+i_S^0)+\tau_S^0+\gamma_S^0]P_S^0;$$

*Paragraph 23.104*

$\gamma_S{}^1P_S{}^1(1-\delta_0)Q_S{}^0$

*Footnote #52:*

$\tau_S{}^1P_S{}^1(1-\delta_0)Q_S{}^0$