

$$Y_t = K_{t-1}^\alpha \left(\exp(z_t^Y) L_t \right)^{1-\alpha} \quad (1)$$

$$z_t^Y = a^Y z_{t-1}^Y + e_t^Y \quad (2)$$

$$\varphi_t = \left(\frac{W_t}{\exp(z_t^Y) (1-\alpha)} \right)^{1-\alpha} \left(\frac{r_t^K}{\alpha} \right)^\alpha \quad (3)$$

$$W_t = \frac{Y_t (1-\alpha) \varphi_t}{L_t} \quad (4)$$

$$r_t^K = \frac{Y_t \alpha \varphi_t}{K_{t-1}} \quad (5)$$

$$D_t^I = Y_t \left(1 - \varphi_t - \frac{\phi^I}{2} (\pi_t - 1)^2 \right) \quad (6)$$

$$Y_t \pi_t \phi^I (\pi_t - 1) = Y_t \kappa (\varphi_t - 1) + \pi_{t+1} \phi^I (1+n) \frac{\pi_{t+1}}{r_{t+1}^K} (\pi_{t+1} - 1) Y_{t+1} \quad (7)$$

$$D_t^K = q_t I_t - I_t \left(1 - \phi^K \left(\frac{I_t}{I_{t-1}} - 1 \right)^2 \right) \quad (8)$$

$$K_t = \left(K_{t-1} (1-\delta) + I_t \left(1 - \left(\phi^K \frac{I_t}{I_{t-1}} - 1 \right)^2 \right) \right) z_t^K \quad (9)$$

$$z_t^K = a^K z_{t-1}^K + e_t^K \quad (10)$$

$$q_t = \frac{\pi_t}{R_{t+1}} \left(r_{t+1}^K + (1-\delta) q_{t+1} \right) \quad (11)$$

$$(1+n) \psi_t = 1 - \omega + \gamma \psi_{t-1} \quad (12)$$

$$V_t^o = (\epsilon_t \theta_t)^{\frac{(-1)}{\rho}} C_t^o \left(\frac{1-v}{v} \frac{1}{W_t \xi} \right)^{1-v} \quad (13)$$

$$C_t^o = \epsilon_t \theta_t \left(\frac{R_{t-1} A_{t-1}^o}{\pi_t} + H_t^o + S_t^o - \xi T_t^o \right) \quad (14)$$

$$S_t^o = E_t^o + \frac{\pi_t \gamma}{R_t} S_{t+1}^o \quad (15)$$

$$E_t^o = \rho (W_t - T_t^y) \quad (16)$$

$$L_t^o = \psi_t - C_t^o \frac{1-v}{v} \frac{1}{W_t \xi} \quad (17)$$

$$H_t^o = W_t \xi L_t^o + \frac{\pi_{t+1} \gamma}{R_{t+1}} H_{t+1}^o \quad (18)$$

$$PT_t^o = \xi T_t^o + \frac{\pi_{t+1} \gamma}{R_{t+1}} PT_{t+1}^o \quad (19)$$

$$A_t^o = \frac{R_{t-1} A_{t-1}^o}{\pi_t} - C_t^o + (1+\omega) \left(W_t + \frac{R_{t-1} A_{t-1}^y}{\pi_t} - C_t^y \right) \quad (20)$$

$$\epsilon_t \theta_t = 1 - \gamma \frac{\epsilon_t \theta_t}{\epsilon_{t+1} \theta_{t+1}} R_{t+1}^{\frac{\rho}{1-\rho}} \beta^{\frac{\rho}{1-\rho}} \left(\frac{1}{\pi_{t+1}} \right)^{\frac{\rho v}{1-\rho}} \left(\frac{W_t}{W_{t+1}} \right)^{\frac{\rho(1-v)}{1-\rho}} \quad (21)$$

$$V_t^y = C_t^y \theta_t^{\frac{(-1)}{\rho}} \left(\frac{1-v}{v} \frac{1}{W_t} \right)^{1-v} \quad (22)$$

$$C_t^y = \theta_t \left(\frac{R_{t-1} A_{t-1}^y}{\pi_t} + H_t^y + S_t^y - T_t^y \right) \quad (23)$$

$$S_t^y = S_{t+1}^o \frac{\pi_{t+1} (\Omega_{t+1} - \omega)}{R_t \Omega_{t+1}} + \frac{\pi_{t+1} \omega}{R_t \Omega_{t+1}} S_{t+1}^y \quad (24)$$

$$L_t^y = 1 - C_t^y \frac{1-v}{v} \frac{1}{W_t} \quad (25)$$

$$H_t^y = W_t L_t^y + \omega \frac{\pi_{t+1} H_{t+1}^y}{R_{t+1} \Omega_{t+1}} + (1-\omega) \epsilon_{t+1} \frac{\rho-1}{\rho} \left(\frac{1}{\xi}\right)^{1-v} \frac{\pi_{t+1} H_{t+1}^o}{R_{t+1} \Omega_{t+1}} \quad (26)$$

$$PT_t^y = T_t^y + \omega \frac{\pi_{t+1} PT_{t+1}^y}{R_{t+1} \Omega_{t+1}} + (1-\omega) \epsilon_{t+1} \frac{\rho-1}{\rho} \left(\frac{1}{\xi}\right)^{1-v} \frac{\pi_{t+1} PT_{t+1}^o}{R_{t+1} \Omega_{t+1}} \quad (27)$$

$$A_t^y = \omega \left(\frac{R_{t-1} A_{t-1}^y}{\pi_t} + W_t L_t^y - C_t^y \right) \quad (28)$$

$$\theta_t = 1 - R_{t+1} \frac{\rho}{1-\rho} \left(\frac{1}{\pi_{t+1}}\right)^{\frac{\rho}{1-\rho}} \beta \frac{1}{1-\rho} \Omega_{t+1} \frac{\rho}{1-\rho} \left(\frac{W_{t+1}}{W_t}\right)^{\frac{\rho(v-1)}{1-v}} \frac{\theta_t}{\theta_{t+1}} \quad (29)$$

$$\Omega_{t+1} = \omega + \left(\frac{1}{\xi}\right)^{1-v} (1-\omega) \epsilon_{t+1} \frac{-(1-\rho)}{\rho} \quad (30)$$

$$C_t = C_t^o + C_t^y \quad (31)$$

$$\lambda_t = \frac{A_t^o}{A_t} \quad (32)$$

$$A_t (1+n) (\lambda_t - (1-\omega)) = \omega (1 - \epsilon_t \theta_t) \lambda_{t-1} \frac{R_{t-1} A_{t-1}}{\pi_t} \quad (33)$$

$$V_t = V_t^o + V_t^y \quad (34)$$

$$(1+n) B_t = \frac{R_{t-1}}{\pi_t} B_{t-1} + G_t + E_t - T_t \quad (35)$$

$$T_t = \xi T_t^o + T_t^y \quad (36)$$

$$G_t = g \quad (37)$$

$$(1+n) B_t = b \quad (38)$$

$$E_t = \psi_t \varrho (Y_t (1-\alpha) \varphi_t - T_t) \quad (39)$$

$$R_t = \phi^R \bar{R} + R_{t-1} (1 - \phi^R) + \pi_t \phi^\pi + z_t^R \quad (40)$$

$$z_t^R = a^R z_{t-1}^R + e_t^R \quad (41)$$

$$\frac{R_t}{\pi_{t+1}} = \frac{(1+n) (P_{t+1}^K + D_{t+1}^K)}{P_t^K} \quad (42)$$

$$\frac{R_t}{\pi_{t+1}} = \frac{(1+n) (P_{t+1}^I + D_{t+1}^I)}{P_t^I} \quad (43)$$

$$L_t = L_t^y + \xi L_t^o \quad (44)$$

$$Y_t \left(1 - \frac{\phi^I}{2} (\pi_t - 1)^2 - \phi^K \left(\frac{I_t}{I_{t-1}} - 1 \right)^2 \right) = G_t + I_t + C_t + NX_t \quad (45)$$

$$NX_t = S_t \phi^{NX} Y^* \exp(z_t^{NX}) \quad (46)$$

$$z_t^{NX} = a^{NX} z_{t-1}^{NX} + e_t^{NX} \quad (47)$$

$$A_t = P_t^I + K_t + B_t + S_t F_t^* \quad (48)$$

$$1 + R_t = (1 + R^* + \Phi_t) \frac{S_{t+1}}{S_t} \quad (49)$$

$$S_t F_t^* = NX_t + S_t (1 + R^* + \Phi_{t-1}) F_{t-1}^* \quad (50)$$

$$\Phi_t = \phi^S (\exp(F_{t-1}^* - \bar{F}^*) - 1) \quad (51)$$