1 SFC Model

$$D_H = D_{H-1} + S_{-1} - S - C + W + M - T + r_S S \tag{1}$$
$$D_{FC} = D_{FC-1} - L_{FC-1} + L_{FC} + C + G - p_K I - W_{FC} - \Pi_{FC} - r_L L_{FC} \tag{2}$$
$$D_{FK} = D_{FK-1} - L_{FK-1} + L_{FK} + p_K I - W_{FK} - \Pi_{FK} - r_L L_{FK} \tag{3}$$
$$D = D_H + D_{FC} + D_{FK} \tag{4}$$
$$S = \max(0, D_{H-1} + S_{-1} - \rho_C C) \tag{5}$$
$$L_{FC} = \max(0, W_{FC} - D_{FC-1}, W_{FC} + p_K I - D_{FC-1} - (C+G)) + (1-\gamma) L_{FC-1} \tag{6}$$
$$L_{FK} = \max(0, W_{FK} - D_{FK-1}) + (1-\gamma) L_{FK-1} \tag{7}$$
$$L = L_{FC} + L_{FC} \tag{8}$$
$$B_B = (L_{-1} + B_{B-1} - D_{-1} - S_{-1} - L + D + S + \Pi - r_S S + r_L L)/(1 - r_B) \tag{9}$$
$$B_G = (B_{G-1} + G + M - T)/(1 - r_B) \tag{10}$$
$$B_G = B_B \tag{11}$$
$$K_{FC} = (1-\gamma) K_{FC-1} + I \tag{12}$$
$$K_{FK} = (1-\gamma) K_{FK-1} + \Delta K - I \tag{13}$$
$$C = \min(C^T, \min(K_{FC-1}, n_C)\beta k - G) \tag{14}$$
$$G = \min(G^T, \min(K_{FC-1}, n_C)\beta k) \tag{15}$$
$$I = \min(I^T, \max(0, (1-\gamma) K_{FK-1} + \Delta K - (\gamma K_{FK-1} + I^T_{-1})/\beta)) \tag{16}$$
$$\Delta K = \min(\Delta K^T, \min(K_{FK-1}, n_K)\beta) \tag{17}$$
$$C^T = \max(0, a_Y(W + M) + a_V(D_{H-1} + S_{-1})) \tag{18}$$
$$G^T = \max(0, \delta Y) + T - M - r_B B_G \tag{19}$$
$$I^T = \max(0, (C^T + G^T)/(\beta k p_C) - (1-\gamma) K_{FC-1}) \tag{20}$$
$$\Delta K^T = \max(0, (\gamma K_{FK-1} + I^T_{-1})/(u^T \beta)) - (1-\gamma) K_{FK-1} \tag{21}$$
$$W = W_{-1} \frac{1-\omega_{-1}}{1-\omega} a_W^{(\omega^T - \omega)} \tag{22}$$
$$W_{FC} = W n_C/(1-\omega) \tag{23}$$
$$W_{FK} = W(n_K + n_Q)/(1-\omega) \tag{24}$$
$$M = \phi W_{-1} \frac{\omega}{1-\omega_{-1}} \tag{25}$$
$$T = \tau_W W + \tau_C C + \tau_S r_S S \tag{26}$$
$$\Pi_{FC} = \max(0, r_F(D_{FC} - L_{FC})) \tag{27}$$
$$\Pi_{FK} = \max(0, r_F(D_{FK} - L_{FK})) \tag{28}$$
$$\Pi = \Pi_{FC} + \Pi_{FK} \tag{29}$$
$$r_S = \max(0, r_B + \alpha_4 \max(0, \Gamma - \Gamma^T)) \tag{30}$$
$$r_L = \max(0, r_B - \alpha_5 \max(0, \Gamma - \Gamma^T)) \tag{31}$$
$$r_B = \max(0, \min(0.1, \psi + \alpha_1(\psi - \psi^T) - \alpha_2(\omega - \omega^T) + \alpha_3(u - u^T))) \tag{32}$$
$$p_C = (1 + \mu_C) W/((1-\omega)\beta k) \tag{33}$$
$$p_K = (1 + \mu_K) W_{FK}/I \tag{34}$$
$$\beta = \beta_{-1}(1 + n_Q)^b \tag{35}$$
$$n_C^T = \min(K_{FC-1}, (C^T + G^T)/(p_C \beta k)) \tag{36}$$
$$n_K^T = \min(K_{FK-1}, \Delta K^T/\beta) \tag{37}$$
$$n_C = n_C^T / max(1, n_C^T + n_K^T) \tag{38}$$

$$n_K = n_K^T / max(1, n_C^T + n_K^T) \tag{39}$$
$$n_Q = \min(1 - (n_C + n_K), \max(0, \rho_Q(p_K I - W_{FK})(1 - \omega)/W)) \tag{40}$$
$$Y = C + G + p_K I \tag{41}$$
$$\omega = 1 - (n_C + n_K + n_Q) \tag{42}$$
$$\psi = \frac{p_C}{p_{C-1}} - 1 \tag{43}$$
$$g = \frac{Y}{Y_{-1}} - 1 \tag{44}$$
$$u = (n_C + n_K)/(K_{FC} + K_{FK}) \tag{45}$$
$$\Gamma = (L_{-1} + B_{B-1} - D_{-1} - S_{-1})/L_{-1} \tag{46}$$