Special Notations:

Marks	Notation	Code Marks
o_t	Scaling coefficient for wage profiling	WScaleCoef
$\varepsilon(s)$	Relative wage profile	WProfileCoef
LI_t	Gap of pooling medical account	gapUMP
μ, σ	Consumption, Wage tax rate	Mu, Sigma
κ	Depreciation rate	Kappa
θ, η	Personal, Firm contribution to pension	Theta, Eta
ϕ, ζ	Personal, Firm contribution to medical	phiCoef, Zeta
Λ	Pension benefit	Lambda
π, π^M	Total contribution of pension, medical	Pi, PiM
F	Mortality	F
q	Ratio of medical fee to total consumption	Q
p	Ratio of Outpatient fee to Inpatient fee	P
a, Φ	Personal asset, Individual medical account	A, Phi
cp^B	Copayment rate of inpatient fee	cpB
γ	Inter-temporal substitution elasticity	Gamma
α	Preference of leisure than consumption	Alpha
ϱ	Consumption substitution elasticity of labour	Varrho
$\mathbb{a}$	Transfer rate from firm contribution to individual medical account (working phase)	DoubleA
$\mathbb{b}$	Transfer rate from firm contribution to the individual medical account of those retired	DoubleB
$\mathbb{k}$	Cap of D/Y ratio	DoubleK
$\mathbb{P}$	Transferred amount from firm contribution to the individual medical account of the retired	DoubleP
z	Collection rate of pension	z

Firm:

- Production Function: $Y_t = A_t K_t^{\beta} L_t^{1-\beta}$
  - Net Interest Rate: $r_t = \frac{\partial Y_t}{\partial K_t} - \kappa$
  - Average Wage: $\bar{w}_t = \frac{\partial Y_t}{\partial L_t}$
- Wage Profile: $w_{s,t} = \bar{w}_t \varepsilon(s) o_t$
  - $\bar{w}_t L_t = \sum_{s=1}^{S_r} w_{s,t} N_{s,t} (1 - l_{s,t})$

Government:

- Budget: $TR_t + D_{t+1} = G_t + LI_t + r_t D_t$
- Tax Revenue: $TR_t = \mu \sum_{s=1}^{S} N_{s,t} c_{s,t} + \sigma \sum_{s=1}^{S_r} N_{s,t} w_{s,t} (1 - l_{s,t})$
- Soft Cap Constraint: $\frac{D_t}{Y_t} \leq \mathbb{k}_t$

Pension:

- PAYG Pension: $\sum_{s=1}^{S_r} \pi_t w_{s,t} N_{s,t} (1 - l_{s,t}) = \sum_{s=S_r+1}^{S} \Lambda_{s,t} N_{s,t}$
- Pension Contribution: $\pi = \frac{z(\theta+\eta)}{1+z\eta+\zeta}$

Individual Medical Account:

- Ante-retire: $\left(2 - \frac{1}{1-F_s}\right) \Phi_{s+1} = (1 + r_s)\Phi_s + \frac{\phi_s + \mathbb{a}_s \zeta_s}{1+z_s\eta_s+\zeta_s} w_s (1 - l_s) - \frac{q_s p_s}{1+p_s} c_s$
- Post-retire: $\left(2 - \frac{1}{1-F_s}\right) \Phi_{s+1} = (1 + r_s)\Phi_s + \mathbb{P}_s - \frac{q_s p_s}{1+p_s} c_s$

- Outpatient Expenditure $MA_s = \frac{q_s p_s}{1+p_s} c_s$
- Transfer from firm contribution to individual medical account: $\mathbb{a}_s = 0.3$
- Transfer Payment by firms when retired $\mathbb{P}_s$:
  - $\left(\sum_{s=S_r+1}^{S} N_{s,t}\right)\mathbb{P}_t = \sum_{s=1}^{S_r} \mathbb{b}_t \frac{\zeta_t}{1+z_s\eta_t+\zeta_t} w_{s,t}(1-l_{s,t})N_{s,t}$, where $\mathbb{b}$ is the transfer rate from firm contribution to those retired.
  - $\mathbb{P}_{s,t} = \mathbb{P}_t$

Pooling Medical Account:

- PAYG:

$$\sum_{s=1}^{S} \frac{1-cp_t^B}{1+p_t} q_{s,t} c_{s,t} N_{s,t} = (1-\mathbb{a}_t-\mathbb{b}_t)\frac{\zeta_t}{1+z_s\eta_t+\zeta_t}\sum_{s=1}^{S_r} w_{s,t}(1-l_{s,t})N_{s,t} + LI_t$$

Household:

- Cross-Sectional Utility Function: $u(c,l|q,\alpha,\gamma,\varrho) = \frac{1}{1-\gamma^{-1}}\left[((1-q)c)^{1-\varrho^{-1}} + \alpha l^{1-\varrho^{-1}}\right]^{\frac{1-\gamma^{-1}}{1-\varrho^{-1}}}$
  - Discount Factor: $\beta_s^u = \frac{1-F_s}{1-\delta}$
  - Bellman Equation: $v_s = \max[u(c_s,l_s) + \beta_s^u v_{s+1}]$
- Ante-retire: $\left(2-\frac{1}{1-F_s}\right)a_{s+1} = (1+r_s)a_s + (1-\sigma-\pi_s-\pi_s^M)w_s(1-l_s) - c_s + \frac{1}{1+p_s}[p_s + (1-cp_s^B)]q_s c_s$
- Post-retire:

$$\left(2-\frac{1}{1-F_s}\right)a_{s+1} = (1+r_s)a_s + \Lambda_s - c_s + \frac{1}{1+p_s}[p_s + (1-cp_s^B)]q_s c_s$$

Equilibrium:

- Capital: $K_t = \sum_{s=1}^{S} N_{s,t}(a_{s,t} + \Phi_{s,t}) + D_t$
- Labour: $L_t = \sum_{s=1}^{S_r} N_{s,t} w_{s,t}(1-l_{s,t})$
- Good: $Y_t = C_t + I_t + G_t$
  - $C_t = \sum_{s=1}^{S} N_{s,t} c_{s,t}$
  - $K_{t+1} = I_t + (1-\kappa)K_t$