Mathematical Appendix

In this appendix, we first summarize the equations which determine equilibrium (including the foreign country part). All equations are described in more detail in the main text. Second, we describe how to derive the steady state.

A.1 Equation summary

Country A

Price dynamics:

$$q1_t = \lambda_t^o Y_t mc_t + \beta\theta_P E_t \left\{\pi^{\epsilon}_{A,t+1} \cdot q1_{t+1}\right\}, \tag{A.1}$$

$$q2_t = \lambda_t^o Y_t \left(1/p_B t\right)^{1-\omega-\psi} + \beta\theta_P E_t \left\{\pi^{\epsilon-1}_{A,t+1} \cdot q2_{t+1}\right\}, \tag{A.2}$$

$$\tilde{p}_{A,t} = \frac{P^*_{A,t}}{P_{A,t}} = \frac{\epsilon}{\epsilon-1} \cdot \frac{q1_t}{q2_t}. \tag{A.3}$$

The *aggregate price level* is

$$1 = \theta_P \left(\frac{1}{\pi_{At}}\right)^{1-\epsilon} + (1-\theta_P)\tilde{p}^{1-\epsilon}_{A,t}. \tag{A.4}$$

Price dispersion is then given by

$$D_t = (1-\theta_P)\tilde{p}^{-\epsilon}_{A,t} + \theta_P \pi^{\epsilon}_{A,t} D_{t-1}. \tag{A.5}$$

CPI inflation is

$$\pi_t = \pi_{At} \left(\frac{p_{Bt}}{p_{Bt-1}}\right)^{1-\omega-\psi}. \tag{A.6}$$

The **current account per capita** is given by

$$d_t = \frac{R^{ecb}_{t-1} e^{-\psi_2 (d_{t-1}-\bar{d})/Y_{t-1}}}{\pi_{At}} d_{t-1} + \frac{1-\omega}{\omega}\left(C^*_{At} + I^*_{At}\right) - p_{Bt}\left(C_{Bt} + I_{Bt}\right). \tag{A.7}$$

Households: Consumption and investment decomposition as well as its aggregation is given by

$$c^o_t = \left(1/p_{Bt}\right)^{(1-\omega-\psi)} c^o_{At} + p^{(\omega+\psi)}_{Bt} \cdot c^o_{Bt},^{1} \tag{A.8}$$

$$\frac{c^o_{At}}{c^o_{Bt}} = \frac{\omega+\psi}{1-\omega-\psi} p_{Bt}, \tag{A.9}$$

$$I^o_t = \left(1/p_{Bt}\right)^{(1-\omega-\psi)} I^o_{At} + p^{(\omega+\psi)}_{Bt} \cdot I^o_{Bt}, \tag{A.10}$$

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[1] Note that it can be shown that, taking into account the CPI, this expression is equal to $c^o_t = \left(c^o_{At}/(\omega+\psi)\right)^{\omega+\psi}\left(c^o_{Bt}/(1-\omega-\psi)\right)^{1-\omega-\psi}$ as stated in the main text and, hence, $P_t c^o_t = P_{At} c^o_{At} + P_{Bt} c^o_{Bt}$. The same holds for the RoT consumption basket and private investment. Analoguously, this holds for the foreign country.

$$\frac{I^o_{At}}{I^o_{Bt}} = \frac{\omega+\psi}{1-\omega-\psi} p_{Bt}. \tag{A.11}$$

$$C_{At} = (1-\mu)\, c^o_{At} + \mu c^r_{At}, \tag{A.12}$$

$$I_{At} = (1-\mu)\, I^o_{At} \tag{A.13}$$

$$C_{Bt} = (1-\mu)\, c^o_{Bt} + \mu c^r_{Bt}, \tag{A.14}$$

$$I_{Bt} = (1-\mu)\, I^o_{Bt}, \tag{A.15}$$

$$c^r_t = (1/p_{Bt})^{(1-\omega-\psi)}\, c^r_{At} + p_{Bt}^{(\omega+\psi)} \cdot c^r_{Bt}, \tag{A.16}$$

$$\frac{c^r_{At}}{c^r_{Bt}} = \frac{\omega+\psi}{1-\omega-\psi} p_{Bt}, \tag{A.17}$$

First-order conditions are

$$\lambda^o_t = \beta \cdot E_t \left\{ \lambda^o_{t+1} \cdot \frac{R_t \cdot (1-\tau^b_{t+1}) + \tau^b_{t+1}}{\pi_{t+1}} \right\}, \tag{A.18}$$

$$\lambda^o_t = \frac{\left[c^o_t - h \cdot c^o_{t-1}\right]^{-\sigma_c} - \beta \cdot h \cdot E_t \left\{ \left[c^o_{t+1} - h \cdot c^o_t\right]^{-\sigma_c} \right\}}{(1+\tau^c_t)}, \tag{A.19}$$

$$Q_t = \beta \cdot E_t \left\{ \frac{\lambda^o_{t+1}}{\lambda^o_t} \left[(1-\delta^k) Q_{t+1} + (1-\tau^k_{t+1}) \cdot r^k_{t+1} + \tau^k_{t+1} \cdot \delta^k \right] \right\}, \tag{A.20}$$

where

$$S_t = \frac{\kappa_I}{2} \left(\frac{I^o_t}{I^o_{t-1}} - 1 \right)^2 \tag{A.21}$$

is the investment adjustment cost function, while its (direct) derivation is given by

$$S1_t = \kappa_I \left(\frac{I^o_t}{I^o_{t-1}} - 1 \right). \tag{A.22}$$

$$1 = Q_t \left(1 - S_t - \frac{I^o_t}{I^o_{t-1}} S1_t \right) + \beta \cdot E_t \left\{ \frac{\lambda^o_{t+1}}{\lambda^o_t} Q_{t+1} \left(\frac{I^o_{t+1}}{I^o_t} \right)^2 S1_{t+1} \right\}, \tag{A.23}$$

$$\lambda^o_t = \beta R^{ecb}_t e^{-\psi_2 (d_t - \bar{d})/Y_t} E_t \frac{\lambda^o_{t+1}}{\pi_{t+1}}, \tag{A.24}$$

$$\lambda^r_t = \frac{\left[c^r_t - h \cdot c^r_{t-1}\right]^{-\sigma_c} - \beta \cdot h \cdot E_t \left\{ \left[c^r_{t+1} - h \cdot c^r_t\right]^{-\sigma_c} \right\}}{(1+\tau^c_t)}, \tag{A.25}$$

Further aggregation yields

$$c^r_t = \frac{(1-\tau^w_t)\left(n^{p,r}_t \cdot w^p_t + n^{g,r}_t \cdot w^g_t\right) + (1 - n^{p,r}_t - n^{g,r}_t)\kappa^B}{(1+\tau^c_t)}, \tag{A.26}$$

$$C_t = (1-\mu) \cdot c^o_t + \mu \cdot c^r_t, \tag{A.27}$$

$$k_t = (1-\mu) k^o_t, \tag{A.28}$$

$$\frac{B_t}{P_t} = (1-\mu)\frac{B_t^o}{P_t}, \tag{A.29}$$

$$I_t = (1-\mu) I_t^o,. \tag{A.30}$$

Aggregate output, employment and capital (including its law of motion) as well as marginal productivity of capital and labor:

$$Y_t^{tot} = Y_t + \tilde{g}_t, \tag{A.31}$$

$$Y_t = C_t^g + C_{At} + I_{At} + I_t^g + \frac{1-\omega}{\omega}\left(C_{At}^* + I_{At}^*\right), \tag{A.32}$$

$$Y_t \cdot D_t = \epsilon^a \cdot \left(k_{t-1}^g\right)^\eta \cdot \left[\tilde{k}_t\right]^\alpha \cdot \left[l_t\right]^{(1-\alpha)}, \tag{A.33}$$

where we have $l_t = N_t^p$ in the codes (i.e. we assume $\bar{h} = 1$).

$$N_t^p = (1-\mu) \cdot n_t^{p,o} + \mu \cdot n_t^{p,r}, \tag{A.34}$$

$$N_t^g = (1-\mu) \cdot n_t^{g,o} + \mu \cdot n_t^{g,r} \tag{A.35}$$

$$k_t^o = (1-\delta^k) k_{t-1}^o + (1-S_t) I_t^o, \tag{A.36}$$

$$x_t = mc_t \cdot (1-\alpha) \cdot \frac{Y_t}{l_t}, \tag{A.37}$$

$$r_t^k = mc_t \cdot \alpha \cdot \frac{Y_t}{\tilde{k}_t}, \tag{A.38}$$

where $\tilde{k}_t = k_{t-1}$.
For the **labor market**, we get

$$q_t^p = \frac{M_t^p}{v_t^p}, \tag{A.39}$$

$$q_t^g = \frac{M_t^g}{v_t^g}, \tag{A.40}$$

$$p_t^p = \frac{M_t^p}{\tilde{U}_t}, \tag{A.41}$$

$$p_t^g = \frac{M_t^g}{\tilde{U}_t}. \tag{A.42}$$

$$M_t^p = \kappa_e^p \cdot \left(\tilde{U}_t\right)^{\varphi^p} \cdot \left(v_t^p\right)^{(1-\varphi^p)}, \tag{A.43}$$

$$M_t^g = \kappa_e^g \cdot \left(\tilde{U}_t\right)^{\varphi^g} \cdot \left(v_t^g\right)^{(1-\varphi^g)}. \tag{A.44}$$

The *employment laws of motion* as well as the necessary *unemployment rates* can be stated as

$$n_t^{p,o} = (1-s^p) \cdot n_{t-1}^{p,o} + p_t^p \cdot \left[1 - (1-s^p) n_{t-1}^{p,o} - (1-s^g) n_{t-1}^{g,o}\right], \tag{A.45}$$

$$n_t^{g,o} = (1-s^g) \cdot n_{t-1}^{g,o} + p_t^g \cdot \left[1 - (1-s^p) n_{t-1}^{p,o} - (1-s^g) n_{t-1}^{g,o}\right], \tag{A.46}$$

$$n_t^{p,r} = (1-s^p) \cdot n_{t-1}^{p,r} + p_t^p \cdot \left[1 - (1-s^p) n_{t-1}^{p,r} - (1-s^g) n_{t-1}^{g,r}\right], \tag{A.47}$$

$$n_t^{g,r} = (1-s^g)\cdot n_{t-1}^{g,r} + p_t^g \cdot \left[1-(1-s^p)n_{t-1}^{p,r} - (1-s^g)n_{t-1}^{g,r}\right]. \tag{A.48}$$

$$U_t = \left(1 - N_t^{tot}\right) = \left(1 - N_t^p - N_t^g\right), \tag{A.49}$$

$$N_t^{tot} = N_t^p + N_t^g, \tag{A.50}$$

$$\tilde{U}_t = U_{t-1} + s^p N_{t-1}^p + s^g N_{t-1}^g. \tag{A.51}$$

We can state the **private real wage law of motion** as

$$\begin{aligned} w_t^p \cdot N_t^p &= (1-s^p)N_{t-1}^p\left[(1-\theta_w)\tilde{w}_t^p + \theta_w \cdot w_{t-1}^p \cdot \pi_t^{-1}\right] \\ &\quad + M_t^P\left[(1-\theta_w^n)\tilde{w}_t^p + \theta_w^n \cdot w_{t-1}^p \cdot \pi_t^{-1}\right]. \end{aligned} \tag{A.52}$$

Firms' asset value functions are given by[2]
Adjunct variables:

$$A1_t = J_t + \beta E_t\left\{\frac{\lambda_{t+1}^o}{\lambda_t^o}\theta_w(1-s^p)A1_{t+1}\right\}, \tag{A.53}$$

$$A2_t = \bar{h}x_t + \beta E_t\left\{\frac{\lambda_{t+1}^o}{\lambda_t^o}\theta_w(1-s^p)A2_{t+1}\right\}, \tag{A.54}$$

$$A3_t = 1 + \beta E_t\left\{\frac{\lambda_{t+1}^o}{\lambda_t^o}\theta_w(1-s^p)A3_{t+1}\right\}, \tag{A.55}$$

$$A4_t = (1-\tau_t^w) + \beta E_t\left\{\frac{\lambda_{t+1}^o}{\lambda_t^o}\theta_w(1-s^p)(\pi_{t+1})^{-1}A4_{t+1}\right\}, \tag{A.56}$$

$$A5_t = 1 + \beta E_t\left\{\frac{\lambda_{t+1}^r}{\lambda_t^r}\theta_w(1-s^p)A5_{t+1}\right\}, \tag{A.57}$$

$$A6_t = (1-\tau_t^w) + \beta E_t\left\{\frac{\lambda_{t+1}^r}{\lambda_t^r}\theta_w(1-s^p)(\pi_{t+1})^{-1}A6_{t+1}\right\}, \tag{A.58}$$

$$A7_t = (1+\tau_t^{sc}) + \beta E_t\left\{\frac{\lambda_{t+1}^o}{\lambda_t^o}\theta_w(1-s^p)(\pi_{t+1})^{-1}A7_{t+1}\right\}. \tag{A.59}$$

The vacancy creation condition is given by

$$\kappa_{tc} + \frac{\kappa^v}{q_t^p} = Vac_t \tag{A.60}$$

and the **sharing rule** by

$$\Omega_t^p = \frac{\xi}{1-\xi}\cdot\frac{((1-\mu)A4_t + \mu A6_t)}{A7_t}\cdot J_t. \tag{A.61}$$

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[2] Note that, due to the need to write it recursively in Dynare, we introduce the adjunct variables $A1t$ to $A7t$. Furthermore, in Dynare, it is programmed in terms of real wages, while we have presented everything in terms of private sector nominal wages in the main text; this is the reason we have to take into account inflation dynamics below. Hence, equations (A.53) to (A.75) are the recursive representation of equations (28) to (32) of the main text.

with

$$J_t = A2_t - A7_t \cdot \tilde{w}_t^p + \beta E_t \left\{ \frac{\lambda_{t+1}^o}{\lambda_t^o} (1 - s^p)(1 - \theta_w) A1_{t+1} \right\}, \tag{A.62}$$

$$J_t^{av} = A2_t - A7_t \cdot \frac{w_{t-1}^p}{\pi_t} + \beta E_t \left\{ \frac{\lambda_{t+1}^o}{\lambda_t^o} (1 - s^p)(1 - \theta_w) A1_{t+1} \right\} \tag{A.63}$$

and

$$Vac_t = (1 - \theta_w^n) J_t + \theta_w^n J_t^{av}. \tag{A.64}$$

For workers, including additional auxiliary variables, it holds that

$$H_t^{aux,o} = \beta(1 - s^p) E_t \left\{ \frac{\lambda_{t+1}^o}{\lambda_t^o} \left[(1 - \theta_w) - p_{t+1}^p (1 - \theta_w^n) \right] \tilde{H}_{t+1}^{o,p} - p_{t+1}^p \theta_w^n H_{t+1}^{o,p,av} - p_{t+1}^p H_t^{o,g} \right\}, \tag{A.65}$$

$$A_t^{aux,o} = H_t^{aux,o} + \beta(1 - s^p)\theta_w E_t \left\{ \frac{\lambda_{t+1}^o}{\lambda_t^o} A_{t+1}^{aux,o} \right\}, \tag{A.66}$$

$$H_t^{aux,r} = \beta(1 - s^p) E_t \left\{ \frac{\lambda_{t+1}^r}{\lambda_t^r} \left[(1 - \theta_w) - p_{t+1}^p (1 - \theta_w^n) \right] \tilde{H}_{t+1}^{r,p} - p_{t+1}^p \theta_w^n H_{t+1}^{r,p,av} - p_{t+1}^p H_t^{r,g} \right\}, \tag{A.67}$$

$$A_t^{aux,r} = H_t^{aux,r} + \beta(1 - s^p)\theta_w E_t \left\{ \frac{\lambda_{t+1}^r}{\lambda_t^r} A_{t+1}^{aux,r} \right\}, \tag{A.68}$$

$$\tilde{H}_t^{o,p} = A4_t \tilde{w}_t^p - A3_t \kappa^B + A_t^{aux,o}, \tag{A.69}$$

$$\begin{aligned} H_t^{o,g} = (1 - \tau_t^w) w_t^g - \kappa^B \quad + \quad & \beta E_t \left\{ \frac{\lambda_{t+1}^o}{\lambda_t^o} (1 - s^g) \left[(1 - p_{t+1}^g) H_{t+1}^{o,g} \right. \right. \\ & \left. \left. - p_{t+1}^p (1 - \theta_w^n) \tilde{H}_{t+1}^{o,p} - p_{t+1}^p \theta_w^n H_{t+1}^{o,p,av} \right] \right\}, \end{aligned} \tag{A.70}$$

$$H_t^{o,p,av} = A4_t \frac{w_{t-1}^p}{\pi_t} - A3_t \kappa^B + A_t^{aux,o}, \tag{A.71}$$

$$\tilde{H}_t^{r,p} = A6_t \tilde{w}_t^p - A5_t \kappa^B + A_t^{aux,r}, \tag{A.72}$$

$$\begin{aligned} H_t^{r,g} = (1 - \tau_t^w) w_t^g - \kappa^B \quad + \quad & \beta E_t \left\{ \frac{\lambda_{t+1}^r}{\lambda_t^r} (1 - s^g) \left[(1 - p_{t+1}^g) H_{t+1}^{r,g} \right. \right. \\ & \left. \left. - p_{t+1}^p (1 - \theta_w^n) \tilde{H}_{t+1}^{r,p} - p_{t+1}^p \theta_w^n H_{t+1}^{r,p,av} \right] \right\}, \end{aligned} \tag{A.73}$$

$$H_t^{r,p,av} = A6_t \frac{w_{t-1}^p}{\pi_t} - A5_t \kappa^B + A_t^{aux,r}, \tag{A.74}$$

while the union's aggregate utility is given by

$$\Omega_t^p = (1 - \mu) \tilde{H}_t^{o,p} + \mu \tilde{H}_t^{r,p}. \tag{A.75}$$

Government's provision of public sector labor services is thus given by

$$\tilde{g}_t = p_{Bt}^{1-\omega-\psi} \cdot \left[(1 + \tau_t^{sc}) \cdot w_t^g \cdot N_t^g \right], \tag{A.76}$$

while the law of motion of public capital is represented by

$$k^g_t = (1-\delta^g)k^g_{t-1} + I^g_t. \tag{A.77}$$

The **fiscal authority's budget constraint** reads

$$\begin{aligned}\frac{G_t}{p_{Bt}^{1-\omega-\psi}} + \kappa^B \cdot U_t + R_{t-1}\cdot\frac{b_{t-1}}{\pi_t} + Sub_t \quad = \quad & \tau^b_t(R_{t-1}-1)\cdot\frac{b_{t-1}}{\pi_t} + (\tau^w_t + \tau^{sc}_t)\left[w^p_t \cdot N^P_t + w^g_t\cdot N^g_t\right] \\ & + \tau^c_t \cdot C_t + \tau^k_t\cdot(r^k_t - \delta^k)k_{t-1} + b_t + T_t, \end{aligned} \tag{A.78}$$

where

$$G_t = C^g_t + I^g_t + \underbrace{p_{Bt}^{1-\omega-\psi}\left[(1+\tau^{sc}_t)w^g_t\cdot N^g_t\right]}_{=\tilde{g}_t} \tag{A.79}$$

and we have defined $b_t = B_t/P_t$. The **tax rules** are

$$X_t = \bar{X} + \rho_X\left(X_{t-1}-\bar{X}\right) + (1-\rho_X)\,\phi_X\cdot e^{aux}_X\cdot\left(\frac{b_{t-1}}{Y^{tot}_{t-1}}p_{Bt-1}^{1-\omega-\psi} - \omega^b\right) + \epsilon^X_t, \tag{A.80}$$

for $X \in \{\tau^w, \tau^{sc}, \tau^b, \tau^c, \tau^k\}$, whereas for all other instruments the assumed rule is

$$\frac{X_t}{\bar{X}} = \left(\frac{X_{t-1}}{\bar{X}}\right)^{\rho_X}\cdot\left(\frac{b_{t-1}}{\omega^b Y^{tot}_{t-1}}p_{Bt-1}^{1-\omega-\psi}\right)^{(1-\rho_X)\phi_X}\cdot\exp\left(\epsilon^X_t\right), \tag{A.81}$$

for $X \in \{C^g, I^g, w^g, N^g, Sub, T\}$.

Country B

Price dynamics:

$$q1^*_t = \lambda^{o*}_t Y^*_t mc^*_t + \beta^*\theta^*_P E_t\left\{\pi^{\epsilon^*}_{B,t+1}\cdot q1^*_{t+1}\right\}, \tag{A.82}$$

$$q2^*_t = \lambda^{o*}_t Y^*_t\left(p_B t\right)^{\omega-\psi^*} + \beta^*\theta^*_P E_t\left\{\pi^{\epsilon^*-1}_{B,t+1}\cdot q2^*_{t+1}\right\}, \tag{A.83}$$

$$\tilde{p}^*_{B,t} = \frac{P^*_{B,t}}{P_{B,t}} = \frac{\epsilon}{\epsilon-1}\frac{\epsilon^*}{\epsilon^*-1}\cdot\frac{q1^*_t}{q2^*_t}. \tag{A.84}$$

The *aggregate price level* is

$$1 = \theta^*_P\left(\frac{1}{\pi_{Bt}}\right)^{1-\epsilon^*} + (1-\theta^*_P)(\tilde{p}^*_{B,t})^{1-\epsilon^*}. \tag{A.85}$$

Price dispersion is then given by

$$D^*_t = (1-\theta^*_P)(\tilde{p}^*_{B,t})^{-\epsilon^*} + \theta^*_P(\pi^*_{B,t})^{\epsilon^*}D^*_{t-1}. \tag{A.86}$$

CPI inflation is

$$\pi^*_t = \pi_{Bt}\left(\frac{p_{Bt-1}}{p_{Bt}}\right)^{\omega-\psi^*}. \tag{A.87}$$

The **current account per capita** is given by

$$p_{Bt} \cdot d_t^* = -\frac{\omega}{1-\omega} \cdot d_t. \tag{A.88}$$

Households: Consumption and investment decomposition as well as its aggregation is given by

$$c_t^{o*} = (1/p_{Bt})^{(1-\omega+\psi^*)} c_{At}^{o*} + p_{Bt}^{(\omega-\psi^*)} \cdot c_{Bt}^{o*}, \tag{A.89}$$

$$\frac{c_{At}^{o*}}{c_{Bt}^{o*}} = \frac{\omega-\psi^*}{1-\omega+\psi^*} p_{Bt}, \tag{A.90}$$

$$I_t^{o*} = (1/p_{Bt})^{(1-\omega+\psi^*)} I_{At}^{o*} + p_{Bt}^{(\omega-\psi^*)} \cdot I_{Bt}^{o*}, \tag{A.91}$$

$$\frac{I_{At}^{o*}}{I_{Bt}^{o*}} = \frac{\omega-\psi^*}{1-\omega+\psi^*} p_{Bt}. \tag{A.92}$$

$$C_{At}^* = (1-\mu^*)\, c_{At}^{o*} + \mu^* c_{At}^{r*}, \tag{A.93}$$

$$I_{At}^* = (1-\mu^*)\, I_{At}^{o*} \tag{A.94}$$

$$C_{Bt}^* = (1-\mu^*)\, c_{Bt}^{o*} + \mu^* c_{Bt}^{r*}, \tag{A.95}$$

$$I_{Bt}^* = (1-\mu^*)\, I_{Bt}^{o*}, \tag{A.96}$$

$$c_t^{r*} = (1/p_{Bt})^{(1-\omega+\psi^*)} c_{At}^{r*} + p_{Bt}^{(\omega-\psi^*)} \cdot c_{Bt}^{r*}, \tag{A.97}$$

$$\frac{c_{At}^{r*}}{c_{Bt}^{r*}} = \frac{\omega-\psi^*}{1-\omega+\psi^*} p_{Bt}, \tag{A.98}$$

First-order conditions

$$\lambda_t^{o*} = \beta^* \cdot E_t \left\{ \lambda_{t+1}^{o*} \cdot \frac{R_t^* \cdot (1-\tau_{t+1}^{b*}) + \tau_{t+1}^{b*}}{\pi_{t+1}^*} \right\}, \tag{A.99}$$

$$\lambda_t^{o*} = \frac{\left[c_t^{o*} - h^* \cdot c_{t-1}^{o*}\right]^{-\sigma_c^*} - \beta^* \cdot h^* \cdot E_t \left\{ \left[c_{t+1}^{o*} - h^* \cdot c_t^{o*}\right]^{-\sigma_c^*} \right\}}{(1+\tau_t^{c*})}, \tag{A.100}$$

$$Q_t^* = \beta^* \cdot E_t \left\{ \frac{\lambda_{t+1}^{o*}}{\lambda_t^{o*}} \left[(1-\delta^{k*}) Q_{t+1}^* + (1-\tau_{t+1}^{k*}) \cdot r_{t+1}^{k*} + \tau_{t+1}^{k*} \cdot \delta^{k*} \right] \right\}, \tag{A.101}$$

where

$$S_t^* = \frac{\kappa_I^*}{2} \left(\frac{I_t^{o*}}{I_{t-1}^{o*}} - 1 \right)^2, \tag{A.102}$$

$$S1_t^* = \kappa_I^* \left(\frac{I_t^{o*}}{I_{t-1}^{o*}} - 1 \right). \tag{A.103}$$

$$1 = Q_t^* \left(1 - S_t^* - \frac{I_t^{o*}}{I_{t-1}^{o*}} S1_t^* \right) + \beta^* \cdot E_t \left\{ \frac{\lambda_{t+1}^{o*}}{\lambda_t^{o*}} Q_{t+1}^* \left(\frac{I_{t+1}^{o*}}{I_t^{o*}} \right)^2 S1_{t+1}^* \right\}, \tag{A.104}$$

$$\lambda_t^{o*} = \beta^* R_t^{ecb} e^{-\psi^*(d_t^* - \bar{d}^*)/Y_t^*} E_t \frac{\lambda_{t+1}^{o*}}{\pi_{t+1}^*}, \tag{A.105}$$

$$\lambda_t^{r*} = \frac{\left[c_t^{r*} - h^* \cdot c_{t-1}^{r*}\right]^{-\sigma_c^*} - \beta^* \cdot h^* \cdot E_t \left\{ \left[c_{t+1}^{r*} - h^* \cdot c_t^{r*}\right]^{-\sigma_c^*} \right\}}{(1 + \tau_t^{c*})}, \tag{A.106}$$

Further aggregation yields

$$c_t^{r*} = \frac{(1 - \tau_t^{w*}) \left(n_t^{p,r*} \cdot w_t^{p*} + n_t^{g,r*} \cdot w_t^{g*}\right) + (1 - n_t^{p,r*} - n_t^{g,r*}) \kappa^{B*}}{(1 + \tau_t^{c*})}, \tag{A.107}$$

$$C_t^* = (1 - \mu^*) \cdot c_t^{o*} + \mu^* \cdot c_t^{r*}, \tag{A.108}$$

$$k_t^* = (1 - \mu^*) k_t^{o*}, \tag{A.109}$$

$$\frac{B_t^*}{P_t^*} = (1 - \mu^*) \frac{B_t^{o*}}{P_t^*}, \tag{A.110}$$

$$I_t^* = (1 - \mu^*) I_t^{o*}, \tag{A.111}$$

Aggregate output, employment and capital (including its law of motion) as well as marginal productivity of capital and labor:

$$Y_t^{tot*} = Y_t^* + \tilde{g}_t^*, \tag{A.112}$$

$$Y_t^* = C_t^{g*} + C_{Bt}^* + I_{Bt}^* + I_t^{g*} + \frac{\omega}{1 - \omega} \left(C_{Bt} + I_{Bt}\right), \tag{A.113}$$

$$Y_t^* \cdot D_t^* = \epsilon^{a*} \cdot \left(k_{t-1}^{g*}\right)^{\eta^*} \cdot \left[\tilde{k}_t^*\right]^{\alpha^*} \cdot \left[l_t^*\right]^{(1-\alpha^*)}, \tag{A.114}$$

where we have $l_t^* = N_t^{p*}$ in the codes (i.e. we assume $\bar{h}^* = 1$).

$$N_t^{p*} = (1 - \mu^*) \cdot n_t^{p,o*} + \mu^* \cdot n_t^{p,r*}, \tag{A.115}$$

$$N_t^{g*} = (1 - \mu^*) \cdot n_t^{g,o*} + \mu^* \cdot n_t^{g,r*} \tag{A.116}$$

$$k_t^{o*} = (1 - \delta^{k*}) k_{t-1}^{o*} + (1 - S_t^*) I_t^{o*}, \tag{A.117}$$

$$x_t^* = mc_t^* \cdot (1 - \alpha^*) \cdot \frac{Y_t^*}{l_t^*}, \tag{A.118}$$

$$r_t^{k*} = mc_t^* \cdot \alpha^* \cdot \frac{Y_t^*}{\tilde{k}_t^*}, \tag{A.119}$$

where $\tilde{k}_t^* = k_{t-1}^*$.
For the **labor market**, we get

$$q_t^{p*} = \frac{M_t^{p*}}{v_t^{p*}}, \tag{A.120}$$

$$q_t^{g*} = \frac{M_t^{g*}}{v_t^{g*}}, \tag{A.121}$$

$$p_t^{p*} = \frac{M_t^{p*}}{\tilde{U}_t^*}, \tag{A.122}$$

$$p_t^{g*} = \frac{M_t^{g*}}{\tilde{U}_t^*}. \tag{A.123}$$

$$M_t^{p*} = \kappa_e^{p*} \cdot \left(\tilde{U}_t^*\right)^{\varphi^{p*}} \cdot \left(v_t^{p*}\right)^{(1-\varphi^{p*})}, \tag{A.124}$$

$$M_t^{g*} = \kappa_e^{g*} \cdot \left(\tilde{U}_t^*\right)^{\varphi^{g*}} \cdot \left(v_t^{g*}\right)^{(1-\varphi^{g*})}. \tag{A.125}$$

The *employment laws of motion* as well as the necessary *unemployment rates* can be stated as

$$n_t^{p,o*} = (1-s^{p*}) \cdot n_{t-1}^{p,o*} + p_t^{p*} \cdot \left[1-(1-s^{p*})n_{t-1}^{p,o*} - (1-s^{g*})n_{t-1}^{g,o*}\right], \tag{A.126}$$

$$n_t^{g,o*} = (1-s^{g*}) \cdot n_{t-1}^{g,o*} + p_t^{g*} \cdot \left[1-(1-s^{p*})n_{t-1}^{p,o*} - (1-s^{g*})n_{t-1}^{g,o*}\right], \tag{A.127}$$

$$n_t^{p,r*} = (1-s^{p*}) \cdot n_{t-1}^{p,r*} + p_t^{p*} \cdot \left[1-(1-s^{p*})n_{t-1}^{p,r*} - (1-s^{g*})n_{t-1}^{g,r*}\right], \tag{A.128}$$

$$n_t^{g,r*} = (1-s^{g*}) \cdot n_{t-1}^{g,r*} + p_t^{g*} \cdot \left[1-(1-s^{p*})n_{t-1}^{p,r*} - (1-s^{g*})n_{t-1}^{g,r*}\right]. \tag{A.129}$$

$$U_t^* = \left(1-N_t^{tot*}\right) = \left(1-N_t^{p*}-N_t^{g*}\right), \tag{A.130}$$

$$N_t^{tot*} = N_t^{p*} + N_t^{g*}, \tag{A.131}$$

$$\tilde{U}_t^* = U_{t-1}^* + s^{p*}N_{t-1}^{p*} + s^{g*}N_{t-1}^{g*}. \tag{A.132}$$

We can state the **private real wage law of motion** as

$$\begin{aligned} w_t^{p*} \cdot N_t^{p*} \quad = \quad & (1-s^{p*})N_{t-1}^{p*}\left[(1-\theta_w^*)\tilde{w}_t^{p*} + \theta_w^* \cdot w_{t-1}^{p*} \cdot (\pi_t^*)^{-1}\right] \\ & + M_t^{P*}\left[(1-\theta_w^{n*})\tilde{w}_t^{p*} + \theta_w^{n*} \cdot w_{t-1}^{p*} \cdot (\pi_t^*)^{-1}\right]. \end{aligned} \tag{A.133}$$

Firms' asset value functions are given by
Adjunct variables:

$$A1_t^* = J_t^* + \beta^* E_t\left\{\frac{\lambda_{t+1}^{o*}}{\lambda_t^{o*}}\theta_w^*(1-s^{p*})A1_{t+1}^*\right\}, \tag{A.134}$$

$$A2_t^* = \bar{h}^* x_t^* + \beta^* E_t\left\{\frac{\lambda_{t+1}^{o*}}{\lambda_t^{o*}}\theta_w^*(1-s^{p*})A2_{t+1}^*\right\}, \tag{A.135}$$

$$A3_t^* = 1 + \beta^* E_t\left\{\frac{\lambda_{t+1}^{o*}}{\lambda_t^{o*}}\theta_w^*(1-s^{p*})A3_{t+1}^*\right\}, \tag{A.136}$$

$$A4_t^* = (1-\tau_t^{w*}) + \beta^* E_t\left\{\frac{\lambda_{t+1}^{o*}}{\lambda_t^{o*}}\theta_w^*(1-s^{p*})(\pi_{t+1}^*)^{-1}A4_{t+1}^*\right\}, \tag{A.137}$$

$$A5_t^* = 1 + \beta^* E_t\left\{\frac{\lambda_{t+1}^{r*}}{\lambda_t^{r*}}\theta_w^*(1-s^{p*})A5_{t+1}^*\right\}, \tag{A.138}$$

$$A6_t^* = (1-\tau_t^{w*}) + \beta^* E_t\left\{\frac{\lambda_{t+1}^{r*}}{\lambda_t^{r*}}\theta_w^*(1-s^{p*})(\pi_{t+1}^*)^{-1}A6_{t+1}^*\right\}, \tag{A.139}$$

$$A7_t^* = (1+\tau_t^{sc*}) + \beta^* E_t\left\{\frac{\lambda_{t+1}^{o*}}{\lambda_t^{o*}}\theta_w^*(1-s^{p*})(\pi_{t+1}^*)^{-1}A7_{t+1}^*\right\}. \tag{A.140}$$

The vacancy creation condition is given by

$$\kappa_{tc}^* + \frac{\kappa^{v*}}{q_t^{p*}} = Vac_t^* \tag{A.141}$$

and the **sharing rule** by

$$\Omega_t^{p*} = \frac{\xi^*}{1-\xi^*} \cdot \frac{((1-\mu^*)A4_t^* + \mu A6_t^*)}{A7_t^*} \cdot J_t^*. \tag{A.142}$$

with

$$J_t^* = A2_t^* - A7_t^* \cdot \tilde{w}_t^{p*} + \beta^* E_t \left\{ \frac{\lambda_{t+1}^{o*}}{\lambda_t^{o*}} (1-s^{p*})(1-\theta_w^*) A1_{t+1}^* \right\}, \tag{A.143}$$

$$J_t^{av*} = A2_t^* - A7_t^* \cdot \frac{w_{t-1}^{p*}}{\pi_t^*} + \beta^* E_t \left\{ \frac{\lambda_{t+1}^{o*}}{\lambda_t^{o*}} (1-s^{p*})(1-\theta_w^*) A1_{t+1}^* \right\} \tag{A.144}$$

and

$$Vac_t^* = (1-\theta_w^{n*}) J_t^* + \theta_w^{n*} J_t^{av*}. \tag{A.145}$$

For workers, it holds that

$$H_t^{aux,o*} = \beta^*(1-s^{p*}) E_t \left\{ \frac{\lambda_{t+1}^{o*}}{\lambda_t^{o*}} \left[(1-\theta_w^*) - p_{t+1}^{p*}(1-\theta_w^{n*} \right] \tilde{H}_{t+1}^{o,p*} - p_{t+1}^{p*} \theta_w^{n*} H_{t+1}^{o,p,av*} - p_{t+1}^{p*} H_t^{o,g*} \right\}, \tag{A.146}$$

$$A_t^{aux,o*} = H_t^{aux,o*} + \beta^*(1-s^{p*}) \theta_w^* E_t \left\{ \frac{\lambda_{t+1}^{o*}}{\lambda_t^{o*}} A_{t+1}^{aux,o*} \right\}, \tag{A.147}$$

$$H_t^{aux,r*} = \beta^*(1-s^{p*}) E_t \left\{ \frac{\lambda_{t+1}^{r*}}{\lambda_t^{r*}} \left[(1-\theta_w^*) - p_{t+1}^{p*}(1-\theta_w^{n*} \right] \tilde{H}_{t+1}^{r,p*} - p_{t+1}^{p*} \theta_w^{n*} H_{t+1}^{r,p,av*} - p_{t+1}^{p*} H_t^{r,g*} \right\}, \tag{A.148}$$

$$A_t^{aux,r*} = H_t^{aux,r*} + \beta^*(1-s^{p*}) \theta_w^* E_t \left\{ \frac{\lambda_{t+1}^{r*}}{\lambda_t^{r*}} A_{t+1}^{aux,r*} \right\}, \tag{A.149}$$

$$\tilde{H}_t^{o,p*} = A4_t^* \tilde{w}_t^{p*} - A3_t^* \kappa^{B*} + A_t^{aux,o*}, \tag{A.150}$$

$$\begin{aligned} H_t^{o,g*} = (1-\tau_t^{w*}) w_t^{g*} - \kappa^{B*} \quad + \quad & \beta^* E_t \left\{ \frac{\lambda_{t+1}^{o*}}{\lambda_t^{o*}} (1-s^{g*}) \left[(1-p_{t+1}^{g*}) H_{t+1}^{o,g*} \right.\right. \\ & \left.\left. - p_{t+1}^{p*}(1-\theta_w^{n*}) \tilde{H}_{t+1}^{o,p*} - p_{t+1}^{p*} \theta_w^{n*} H_{t+1}^{o,p,av*} \right] \right\}, \end{aligned} \tag{A.151}$$

$$H_t^{o,p,av*} = A4_t^* \frac{w_{t-1}^{p*}}{\pi_t^*} - A3_t^* \kappa^{B*} A_t^{aux,o*}, \tag{A.152}$$

$$\tilde{H}_t^{r,p*} = A6_t^* \tilde{w}_t^{p*} - A5_t^* \kappa^{B*} + A_t^{aux,r*}, \tag{A.153}$$

$$\begin{aligned} H_t^{r,g*} = (1-\tau_t^{w*}) w_t^{g*} - \kappa^{B*} \quad + \quad & \beta^* E_t \left\{ \frac{\lambda_{t+1}^{r*}}{\lambda_t^{r*}} (1-s^{g*}) \left[(1-p_{t+1}^{g*}) H_{t+1}^{r,g*} \right.\right. \\ & \left.\left. - p_{t+1}^{p*}(1-\theta_w^{n*}) \tilde{H}_{t+1}^{r,p*} - p_{t+1}^{p*} \theta_w^{n*} H_{t+1}^{r,p,av*} \right] \right\}, \end{aligned} \tag{A.154}$$

$$H_t^{r,p,av*} = A6_t^* \frac{w_{t-1}^{p*}}{\pi_t^*} - A5_t^* \kappa^{B*} + A_t^{aux,r*}, \tag{A.155}$$

while the union's aggregate utility is given by

$$\Omega_t^{p*} = (1-\mu^*) \tilde{H}_t^{o,p*} + \mu^* \tilde{H}_t^{r,p*}. \tag{A.156}$$

Government's provision of public sector labor services is thus given by

$$\tilde{g}_t^* = (1/p_{Bt})^{\omega-\psi^*} \cdot \left[(1+\tau_t^{sc*}) \cdot w_t^{g*} \cdot N_t^{g*}\right], \tag{A.157}$$

while the law of motion of public capital is represented by

$$k_t^{g*} = (1-\delta^{g*})k_{t-1}^{g*} + I_t^{g*}. \tag{A.158}$$

Defining $b_t^* = B_t^*/P_t^*$, the **fiscal authority's budget constraint** reads

$$\begin{aligned} G_t^* p_{Bt}^{\omega-\psi^*} + Sub_t^* + \kappa^{B*} \cdot U_t^* + R_{t-1}^* \cdot \frac{b_{t-1}^*}{\pi_t^*} &= \tau_t^{b*}(R_{t-1}^*-1) \cdot \frac{b_{t-1}^*}{\pi_t^*} + (\tau_t^{w*}+\tau_t^{sc*})\left[w_t^{p*} \cdot N_t^{p*} + w_t^{g*} \cdot N_t^{g*}\right] \\ &\quad + \tau_t^{c*} \cdot C_t^* + \tau_t^{k*} \cdot (r_t^{k*} - \delta^{k*})k_{t-1}^* + b_t^* + T_t^*, \end{aligned} \tag{A.159}$$

where

$$G_t^* = C_t^{g*} + I_t^{g*} + (1/p_{Bt})^{\omega-\psi^*}\left[(1+\tau_t^{sc*})w_t^{g*} \cdot N_t^{g*}\right]. \tag{A.160}$$

The **tax rules** are

$$X_t = \bar{X} + \rho_X\left(X_{t-1} - \bar{X}\right) + (1-\rho_X)\,\phi_X \cdot e_X^{aux} \cdot \left(\frac{b_{t-1}}{Y_{t-1}^{tot}} p_{Bt-1}^{1-\omega-\psi} - \omega^b\right) + \epsilon_t^X, \tag{A.161}$$

for $X \in \{\tau^{w*}, \tau^{sc*}, \tau^{b*}, \tau^{c*}, \tau^{k*}\}$, whereas for all other instruments the assumed rule is

$$\frac{X_t}{\bar{X}} = \left(\frac{X_{t-1}}{\bar{X}}\right)^{\rho_X} \cdot \left(\frac{b_{t-1}}{\omega^b Y_{t-1}^{tot}} p_{Bt-1}^{1-\omega-\psi}\right)^{(1-\rho_X)\phi_X} \cdot \exp\left(\epsilon_t^X\right), \tag{A.162}$$

for $X \in \{C^{g*}, I^{g*}, w^{g*}, N^{g*}, Sub^*, T^*\}$.

Common equations

Terms of trade

$$p_{Bt} = \frac{\pi_{Bt}}{\pi_{At}} p_{Bt-1}. \tag{A.163}$$

Monetary policy As described in the main text, we have defined 'after-VAT' CPI as

$$\pi_t^{\tau^c} = \frac{1+\tau_t^c}{1+\tau_{t-1}^c}\pi_t \tag{A.164}$$

and

$$\pi_t^{\tau^c,*} = \frac{1+\tau_t^{c*}}{1+\tau_{t-1}^{c*}}\pi_t^* \tag{A.165}$$

which is taken into account by the monetary authority,

$$\frac{R_t^{ecb}}{\bar{R}^{ecb}} = \left(\frac{R_{t-1}^{ecb}}{\bar{R}^{ecb}}\right)^{\rho_R} \left\{ \left[\left(\frac{\pi_t^{\tau^c}}{\bar{\pi}^{\tau^c}}\right)^{\omega} \left(\frac{\pi_t^{\tau^c,*}}{\bar{\pi}^{\tau^c,*}}\right)^{1-\omega}\right]^{\phi_\pi} \left[\left(\frac{Y_t^{tot}}{Y_{t-1}^{tot}}\right)^{\omega} \left(\frac{Y_t^{tot*}}{Y_{t-1}^{tot*}}\right)^{1-\omega}\right]^{\phi_y} \right\}^{(1-\rho_R)}. \tag{A.166}$$

This set of equations then describes our economy.

A.2 Steady state calculations

In this section, we show how to solve for the model's deterministic steady state and for the parameter values consistent with the long-run targets in Tables 1 and 2 of the main text, given these long-run targets as well as the parameters chosen on the basis of micro data and other studies.

Given $\bar{\pi}_A$, we are able to calculate $\bar{\pi} = \bar{\pi}^{\tau^c} = \bar{\pi}_A$, $\bar{\pi}^* = \bar{\pi}$ and $\bar{\pi}_B = \bar{\pi}^{\tau^c,*} = \bar{\pi}^*$; see equations (A.6), (A.87), (A.163), (A.164) and (A.165). Given $\bar{U}$, we know that $\bar{N}^{tot} = (1 - \bar{U})$ and, thus, $\bar{N}^g = (1 - \bar{U}) \cdot fracpub$. Hence, $\bar{N}^p = \bar{N}^{tot} - \bar{N}^g = 1 - \bar{U} - \bar{N}^g$; see equations (A.49) and (A.50). Furthermore, we are able to calculate the number of searching workers $\bar{\bar{U}}$ from equation (A.51). Given ω^G, ω^{Cg} and ω^{Ig}, we are able to calculate $\bar{G}$, $\bar{C}^g$ as well as $\bar{I}^g$. Analogously, we are able to calculate the corresponding foreign country values. Using equations (A.31), (A.76) and (A.79), we get $\bar{Y} = \bar{Y}^{tot} - \bar{G} + \bar{C}^g + \bar{I}^g$; correspondingly for $\bar{Y}^*$ by using equations (A.112), (A.157) and (A.160). From these equations (especially the national accounting identity), we can also derive $\bar{\bar{g}} = \bar{G} - \bar{C}^g - \bar{I}^g$ as well as $\bar{\bar{g}}^* = \bar{G}^* - \bar{C}^{g*} - \bar{I}^{g*}$.

Hence, using equations (A.7), (A.32), (A.88) and (A.113) as well as (A.9) to (A.17) and (A.90) to (A.98), we get

$$\bar{p}_B = \frac{\omega}{1-\omega} \cdot \frac{(1-\omega-\psi)\left[\bar{Y}^{tot} - \bar{G}\right]}{(\omega-\psi^*)\left[\bar{Y}^{tot*} - \bar{G}^*\right]} = \frac{\omega}{1-\omega} \cdot \frac{(1-\omega-\psi)\left[\bar{Y} - \bar{C}^g - \bar{I}^g\right]}{(\omega-\psi^*)\left[\bar{Y}^* - \bar{C}^{g*} - \bar{I}^{g*}\right]}, \tag{B.1}$$

where use has been made from the fact that $\bar{C}_B + \bar{I}_B = (1-\omega-\psi)\,(1/\bar{p}_B)\left[\bar{Y}^{tot} - \bar{G}\right]$ and $\bar{C}_A^* + \bar{I}_A^* = (\omega - \psi^*)\bar{p}_B\left[\bar{Y}^{tot*} - \bar{G}^*\right]$,[3] which we have substituted into equation (A.7) for $\bar{d} = 0$ and solved for $\bar{p}_B$.

Now, given $\bar{\bar{g}}$ and the terms-of-trade just derived, we are also in the position to calculate the public sector real wage (in terms of CPI) as[4]

$$\bar{w}^g = \frac{\bar{\bar{g}}\,(1/\bar{p}_B)^{1-\omega-\psi}}{(1+\bar{\tau}^{sc})\bar{N}^g}. \tag{B.2}$$

From equations (A.21) and (A.22) and (A.102) and (A.103), respectively, we know that $\bar{S} = \bar{S1} = \bar{S}^* = \bar{S1}^* = 0$. Hence, $\bar{Q} = \bar{Q}^* = 1$; see equations (A.23) and (A.104). From equation (A.18), we get

$$\bar{R} = \frac{\bar{\pi}/\beta - \bar{\tau}^b}{1 - \bar{\tau}^b}, \tag{B.3}$$

while equation (A.20) and $\bar{Q} = 1$ yields

$$\bar{r}^k = \left[\frac{1}{\beta} - 1 + \delta^k\left(1 - \bar{\tau}^k\right)\right] / \left(1 - \bar{\tau}^k\right). \tag{B.4}$$

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[3] Resulting from the composition of consumption and investment; see equations (A.9) to (A.17); and the market clearing condition and the current account identity; see equations (A.7) and (A.32). Correspondingly for the foreign country.

[4] From now on, we only show derivations for home country variables/parameters as the foreign country derivation – unless explicitly stated below – is perfectly equivalent (of course, using the corresponding foreign country equations, parameters and target values).

We further get from equation (A.24) that

$$\bar{R}^{ecb} = \underbrace{\left[\bar{R}\left(1 - \bar{\tau}^b\right) + \bar{\tau}^b\right]}_{=1/\beta} \cdot exp\left(\psi_2(\bar{d} - \bar{d})/\bar{Y}\right). \tag{B.5}$$

From equation (A.4), we get,

$$\bar{\bar{p}}_A = \left\{\left[1 - \theta_P \cdot \bar{\pi}_A^{\epsilon-1}\right] / \left(1 - \theta_P\right)\right\}^{1/(1-\epsilon)}, \tag{B.6}$$

which, using equation (A.5) yields

$$\bar{D} = \frac{(1 - \theta_P)\bar{\bar{p}}_A^{-\epsilon}}{1 - \theta_P \bar{\pi}_A^{\epsilon}}. \tag{B.7}$$

Using the steady-state version of equations (A.1) and (A.2) as well as equation (A.3), marginal costs in steady state are given by

$$\bar{mc} = \frac{\bar{\bar{p}}_A\left(1 - \theta_P \beta \bar{\pi}_A^{\epsilon}\right)}{\frac{\epsilon}{1-\epsilon} \cdot \left(1 - \theta_P \beta \bar{\pi}_A^{\epsilon-1}\right)} \cdot \left(1/\bar{p}_B\right)^{1-\omega-\psi}. \tag{B.8}$$

This allows us to calculate

$$\bar{x} = (1 - \alpha) \cdot \bar{mc} \cdot \frac{\bar{Y}}{\bar{N}^p} \tag{B.9}$$

by using equation (A.37) as well as

$$\bar{k} = \alpha \cdot \bar{mc} \cdot \frac{Y}{\bar{r}^k} \tag{B.10}$$

by making use of equation (A.38) and bearing in mind that $\bar{\bar{k}} = \bar{k}$. Using the private capital law of motion, equation (A.36), evaluated at the steady state, we get

$$\bar{I} = \delta^k \bar{k}. \tag{B.11}$$

Making use of equations (A.28) and (A.30) allows us to calculate $\bar{k}^o$ and $\bar{I}^o$. Given $\bar{I}^g$ from the target values as well as equation (A.77), we can calculate $\bar{k}^g = \bar{I}^g/\delta^g$, which then allows us, making use of equation (A.33) to calculate

$$\bar{\epsilon}^a = \frac{\bar{Y} \cdot \bar{D}}{(\bar{k}^g)^\eta \cdot \bar{k}^\alpha \cdot (\bar{N}^p)^{(1-\alpha)}}. \tag{B.12}$$

From the employment law of motion from the firms' perspective, i.e. $n_t^{f,i} = N_t^f = (1 - s^f)N_{t-1}^f + q_t^f \cdot v_t^f$, evaluated at the steady state, we get

$$\bar{v}^f = \frac{s^f \cdot \bar{N}^f}{\bar{q}^f}, \tag{B.13}$$

where $f = p, g$ stands for private and public sector, and $i = o, r$. As the result is, from a formal perspective, perfectly equivalent in the private and the public sector, we only present the steady-states results for $f = p, g$. Using equations (A.39) and (A.43) and (A.40) and (A.44), respectively, we get

$$\kappa_e^f = \frac{\bar{v}^f \cdot \bar{q}^f}{\bar{\tilde{U}}^{\varphi^f} (\bar{v}^f)^{1-\varphi^f}}, \tag{B.14}$$

which, again using equations (A.43) and (A.44), yields

$$\bar{M}^f = \kappa_e^f \cdot \bar{\tilde{U}}^{\varphi^f} (\bar{v}^f)^{1-\varphi^f}, \tag{B.15}$$

from which we are able to calculate the job finding probabilities

$$\bar{p}^f = \frac{\bar{M}^f}{\bar{\tilde{U}}} \tag{B.16}$$

by making use of equations (A.41) and (A.42). Using equations (A.45) to (A.48), we get $\bar{n}^{f,i} = \bar{M}^f / s^f$. From equations (A.53) to (A.59) and (A.62) as well as (A.63), we get

$$\bar{\tilde{A}}1 = \bar{A}3 = \bar{A}5 = \frac{1}{1 - \beta(1 - s^p)\theta_w}, \tag{B.17}$$

$$\bar{A}4 = \bar{A}6 = \frac{1 - \bar{\tau}^w}{1 - \beta(1 - s^p)\theta_w \cdot \bar{\pi}^{-1}}, \tag{B.18}$$

$$\bar{A}2 \frac{\bar{x}}{1 - \beta(1 - s^p)\theta_w} \tag{B.19}$$

and

$$\bar{A}7 \frac{1 + \bar{\tau}^{sc}}{1 - \beta(1 - s^p)\theta_w \cdot \bar{\pi}^{-1}}. \tag{B.20}$$

Using equations (A.60) to (A.75) evaluated at the steady state and some mathematical manipulation, we see that, in steady-state, it must hold that

$$\bar{\tilde{w}}^p = \bar{w}^p = (1 + \bar{\tau}^{sc})^{-1} \cdot \frac{\frac{\xi}{1-\xi} \cdot \left(\bar{A}3 / \bar{\tilde{A}}1\right) (AA \cdot \bar{A}2/DD) + (1 + \bar{\tau}^{sc}) \cdot CC \cdot \bar{w}^g}{\frac{\xi}{1-\xi} \left(\bar{A}3 / \bar{\tilde{A}}1\right) (AA \cdot \bar{A}1/DD) + BB}, \tag{B.21}$$

where

$$AA = 1 - \frac{\beta(1 - s^p)\left[1 - \theta_w - \bar{p}^p\right]}{1 - \beta(1 - s^p)\theta_w} - \frac{\beta(1 - s^p)\bar{p}^g}{1 - \beta(1 - s^p)\theta_w} \cdot \frac{\beta(1 - s^g)\bar{p}^p}{1 - \beta(1 - s^g)(1 - \bar{p}^g)},$$

$$BB = \bar{A}3(1 - rrs) + \frac{\beta(1 - s^p)}{1 - \beta(1 - s^p)\theta_w} \cdot \bar{p}^g \cdot \frac{rrs}{1 - \beta(1 - s^g)(1 - \bar{p}^g)},$$

$$CC = \frac{\beta(1 - s^p)}{1 - \beta(1 - s^p)\theta_w} \cdot \frac{\bar{p}^g}{1 - \beta(1 - s^g)(1 - \bar{p}^g)}$$

and

$$DD = 1 - \bar{\tilde{A}}1 \cdot \beta(1 - s^p)(1 - \theta_w).$$

Given $\bar{w}^g$ from equation (B.2), we can solve equation (B.21). This also implies

$$\bar{J} = \bar{J}^{av} = \frac{\bar{A}2 - \bar{\tilde{A}}1(1+\bar{\tau}^{sc})\bar{w}^p}{DD}, \tag{B.22}$$

$$\bar{Vac} = (1-\theta_w^n)\bar{J} + \theta_w^n \bar{J}^{av} \quad \Rightarrow \quad \kappa^v = \bar{q}^p \cdot \left(\bar{Vac} - \kappa_{tc}\right), \tag{B.23}$$

where $\kappa_{tc} = 0.55 \cdot \bar{w}^p$ as described in the main text, and

$$\bar{A}1 = \frac{\bar{J}}{1-\beta(1-s^p)\theta_w}. \tag{B.24}$$

Furthermore, we are able to calculate the unemployment benefit $\kappa^B = rrs \cdot (1-\bar{\tau}^w)\bar{w}^p$. This allows us to derive

$$\bar{\tilde{H}}^{o,p} = \bar{H}^{o,p,av} = \bar{\tilde{H}}^{r,p} = \bar{H}^{r,p,av} = \frac{(1-\bar{\tau}^w)\bar{w}^p BB - (1-\bar{\tau}^w)\bar{w}^g \cdot CC}{AA}, \tag{B.25}$$

$$\bar{H}^{o,g} = \bar{H}^{r,g} = \frac{(1-\bar{\tau}^w)\bar{w}^g - \kappa^B - \beta \cdot \bar{p}^p \cdot (1-s^g) \cdot \bar{\tilde{H}}^{o,p}}{1-\beta(1-s^g)(1-\bar{p}^g)} \tag{B.26}$$

and

$$\bar{\Omega} = (1-\mu)\bar{\tilde{H}}^{o,p} + \mu \bar{H}^{o,p,av} = \bar{\tilde{H}}^{o,p}. \tag{B.27}$$

With the auxiliary variables in steady state being equal to

$$\bar{H}^{aux,o} = \bar{H}^{aux,r} = \beta(1-s^p)\left\{\left[(1-\theta_w) - (1-\theta_w^n)\bar{p}^p\right]\bar{\tilde{H}}^{o,p} - \bar{p}^p\theta_w^n\bar{H}^{o,p,av} - \bar{p}^g\bar{H}^{o,g}\right\} \tag{B.28}$$

and

$$\bar{A}^{aux,o} = \bar{A}^{aux,r} = \frac{\bar{H}^{aux,o}}{1-\beta(1-s^p)\theta_w}. \tag{B.29}$$

Making use of equations (A.7) and (A.32), we can now, for $\bar{d} = 0$,[5] derive total per capita consumption as

$$\bar{C} = (1/\bar{p}_B)^{1-\omega-\psi} \cdot [\bar{Y} - \bar{C}^g - \bar{I}^g] - \bar{I}, \tag{B.30}$$

while per capita consumption of RoT households is given by

$$\bar{c}^r = \frac{(1-\bar{\tau}^w)\left(\bar{n}^{p,r} \cdot \bar{w}^p + \bar{n}^{g,r} \cdot \bar{w}^g\right) + (1-\bar{n}^{p,r}-\bar{n}^{g,r})\kappa^B}{(1+\bar{\tau}^c)}; \tag{B.31}$$

see equation (A.107). Hence, given equation (A.27), per capita consumption of optimizing households must be given by

$$\bar{c}^o = \frac{\bar{C} - \mu\bar{c}^r}{1-\mu}, \tag{B.32}$$

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[5] Substitution of (A.7) in (A.32) for $\bar{d} = 0$ yields $\bar{Y} = \bar{C}^g + \bar{I}^g + \bar{C}_A + \bar{I}_A + \bar{p}_B\,[\bar{C}_B + \bar{I}_B]$, which equals $\bar{P}_A\bar{Y} = \bar{P}_A\bar{C}^g + \bar{P}_A\bar{I}^g + \bar{P}_A\bar{C}_A + \bar{P}_A\bar{I}_A + \bar{P}_B\bar{C}_B + \bar{P}_A\bar{I}_B = \bar{P}_A\bar{C}^g + \bar{P}_A\bar{I}^g + \bar{P}\bar{C} + \bar{P}\bar{I}$. Dividing by $\bar{P}$ yields the following equation.

from which we can, by making use of equation (A.19) and (A.25), derive

$$\bar{\lambda}^o = \frac{(1-\beta \cdot h)\left[(1-h)\bar{c}^o\right]^{-\sigma_c}}{(1+\bar{\tau}^c)} \tag{B.33}$$

and

$$\bar{\lambda}^r = \frac{(1-\beta \cdot h)\left[(1-h)\bar{c}^r\right]^{-\sigma_c}}{(1+\bar{\tau}^c)}. \tag{B.34}$$

Using equations (A.1) and (A.2), we are now in the position to get

$$\bar{q}1 = \frac{\bar{\lambda}^o \bar{Y} \bar{mc}}{1-\beta\theta_P \bar{\pi}_A^{\epsilon}} \tag{B.35}$$

and

$$\bar{q}2 = \frac{\bar{\lambda}^o \bar{Y}(1/\bar{p}_B)^{1-\omega-\psi}}{1-\beta\theta_P \bar{\pi}_A^{\epsilon-1}}. \tag{B.36}$$

Furthermore, given total per capita consumption levels per household type as well as investment, we are now also able to decompose the consumption and investment baskets according to equations (A.8) to (A.17) as

$$\bar{c}_A^o = (\omega+\psi)\bar{p}_B^{1-\omega-\psi}\bar{c}^o; \;\; \bar{c}_A^r = (\omega+\psi)\bar{p}_B^{1-\omega-\psi}\bar{c}^r, \tag{B.37}$$

$$\bar{c}_B^o = (1-\omega-\psi)\bar{p}_B^{-\omega-\psi}\bar{c}^o; \;\; \bar{c}_B^r = (1-\omega-\psi)\bar{p}_B^{-\omega-\psi}\bar{c}^r, \tag{B.38}$$

$$\bar{C}_A = (1-\mu)\bar{c}_A^o + \mu\bar{c}_A^r; \;\; \bar{C}_B = (1-\mu)\bar{c}_B^o + \mu\bar{c}_B^r. \tag{B.39}$$

For investment, we get

$$\bar{I}_A = (\omega+\psi)\bar{p}_B^{1-\omega-\psi}\bar{I}; \;\; \bar{I}_B = (1-\omega-\psi)\bar{p}_B^{-\omega-\psi}\bar{I}, \tag{B.40}$$

which implies

$$\bar{I}_A^o = \frac{\bar{I}_A}{1-\mu}; \;\; \bar{I}_B^o = \frac{\bar{I}_B}{1-\mu}. \tag{B.41}$$

It now remains to determine the fiscal authority's steady-state budget constraint. Given the steady-state level of debt (in real terms) by $\bar{b} = \omega^d \cdot \bar{Y}^{tot}$ as well as steady-state subsidies as $S\bar{u}b = \omega^s \cdot \bar{Y}^{tot}\,(1/\bar{p}_b)^{1-\omega-\psi}$ (the latter because GDP is define relative to PPI, while subsidies are defined relative to CPI), we solve equation (A.78) evaluated at the steady state for $\bar{T}$, which gives us the steady state-value for the home country's last missing variable,

$$\begin{aligned} \bar{T} \;\; = \;\; & S\bar{u}b + \frac{\bar{G}}{\bar{p}_B^{1-\omega-\psi}} + \kappa^B \bar{U} + \bar{R}\frac{\bar{b}}{\bar{\pi}} - \Big\{ \bar{\tau}^b(\bar{R}-1)\frac{\bar{b}}{\bar{\pi}} + (\bar{\tau}^w + \bar{\tau}^{sc})\left[\bar{w}^p\bar{N}^p + \bar{w}^g\bar{N}^g\right] \\ & + \bar{\tau}^c\bar{C} + \bar{\tau}^k(\bar{r}^k - \delta^k)\bar{k} + \bar{b}\Big\}. \end{aligned} \tag{B.42}$$

Proceeding analogously in the foreign country then fully solves our model in steady state.