1 Notes

- Equations in working paper in red

2 Dynare LaTeX output

$$\hat{\lambda}_t = \frac{\frac{\kappa}{\bar{g}z}}{1-\frac{\kappa}{\bar{g}z}}\,\hat{c}^R_{t-1} - \frac{1}{1-\frac{\kappa}{\bar{g}z}}\,\hat{c}^R_t - \frac{\frac{\kappa}{\bar{g}z}}{1-\frac{\kappa}{\bar{g}z}}\,\hat{g}_{zt} - \frac{\bar{\tau}^c}{1+\bar{\tau}^c}\,\hat{\tau}^c_t + \frac{1}{\nu_G}\left(\hat{\tilde{c}}^R_t - \hat{c}^R_t\right) + \hat{\varepsilon}^C_t \tag{1}$$

$$\hat{\lambda}_t = -\frac{1}{1-\kappa g_z^{-1}}\hat{\tilde{c}}^R_t + \frac{\kappa g_z^{-1}}{1-\kappa g_z^{-1}}\hat{\tilde{c}}^R_{t-1} - \frac{\kappa g_z^{-1}}{1-\kappa g_z^{-1}}\hat{g}_{z,t} - \frac{1}{1+\tau^c}\hat{\tau}^c_t + \frac{1}{\nu_G}\left(\hat{\tilde{c}}^R_t - \hat{c}^R_t\right) + \hat{\varepsilon}^c_t \tag{2}$$

$$\hat{p}_{It} = \hat{Q}_t + \gamma_I\,\bar{gz}^2\,(1+\beta)\,\hat{\varepsilon}^i_t + \gamma_I\,\bar{gz}^2\left(\beta\left(\hat{i}_{t+1} - \hat{i}_t\right) - \left(\hat{i}_t - \hat{i}_{t-1}\right) + \beta\,\hat{g}_{zt+1} - \hat{g}_{zt}\right) \tag{3}$$

$$\begin{aligned}\hat{Q}_t = {} & \frac{\beta\,(1-\delta)\,epsRPKbar}{\bar{gz}}\,\hat{Q}_{t+1} + \hat{\lambda}_{t+1} - \hat{\lambda}_t - \hat{g}_{zt+1} \\ & - epsRPKbar\,\frac{\frac{\beta\left(1-\bar{\tau}^k\right)\bar{r}_K}{\bar{gz}}}{\bar{p}_I}\left(\frac{1}{1-\bar{\tau}^k}\,\hat{\tau}^k_{t+1} - \hat{r}_{Kt+1} - \hat{u}_{t+1}\right) + epsRPKbar\,\frac{\bar{p}_I\,\beta\,\delta}{\bar{gz}}\left(\hat{\tau}^k_{t+1} + \bar{\tau}^k\,\hat{p}_{It+1}\right)\end{aligned} \tag{4}$$

$$\hat{\lambda}_t = \hat{\lambda}_{t+1} - \hat{g}_{zt+1} + rrp_t - \hat{\pi}_{Ct+1} \tag{5}$$

$$rrp_t = \hat{s}_{t+1} - \hat{s}_t + \hat{\pi}_{Yt+1} - \hat{\pi}^*_{t+1} + \hat{r}^*_t + \hat{\varepsilon}^{RP^*}_t + \frac{\gamma_{B^*}\,lamRPstar\,\bar{s}}{\bar{y}}\left(\hat{b}^*_t - \hat{y}_t\right) \tag{6}$$

$$\hat{k}_t = \frac{1-\delta}{\bar{gz}}\,\hat{k}_{t-1} - \hat{g}_{zt}\,\frac{1-\delta}{\bar{gz}} + \hat{\varepsilon}^i_t\,\gamma_I\,\bar{gz}^2\,(1+\beta)\left(1-\frac{1-\delta}{\bar{gz}}\right) + \hat{i}_t\left(1-\frac{1-\delta}{\bar{gz}}\right) \tag{7}$$

$$\hat{r}_{Kt} = \hat{p}_{It} + \frac{\gamma_{u,2}}{\gamma_{u,1}}\,\hat{u}_t \tag{8}$$

$$\hat{k}^s_t = \hat{k}_{t-1} + \hat{u}_t \tag{9}$$

$$\begin{aligned}\hat{w}_t = {} & \frac{\beta}{1+\beta}\,\hat{w}_{t+1} + \frac{1}{1+\beta}\,\hat{w}_{t-1} + \hat{\pi}_{Ct+1}\,\frac{\beta}{1+\beta} - \frac{1+\beta\,\chi_W}{1+\beta}\,\hat{\pi}_{Ct} + \frac{\chi_W}{1+\beta}\,\hat{\pi}_{Ct-1} \\ & - \frac{\beta\,(1-\chi_W)}{1+\beta}\,\hat{\bar{\pi}}^C_{t+1} + \frac{1-\chi_W}{1+\beta}\,\hat{\bar{\pi}}^C_t - \frac{1}{1+\beta}\,(\hat{g}_{zt} - \beta\,\hat{g}_{zt+1}) \\ & - \frac{(1-\beta\,\theta_W)\,(1-\theta_W)}{(1+\beta)\,\theta_W\left(1+\frac{\bar{\phi}^W}{\bar{\phi}^W-1}\,\sigma_L\right)}\left(\hat{w}_t - \frac{1}{1-\bar{\tau}^w}\,\hat{\tau}^w_t - \left(\sigma_L\left(\hat{N}_t + \hat{\varepsilon}^N_t\right) - \hat{\lambda}_t\right)\right) + \hat{\phi}^W_t\end{aligned} \tag{10}$$

$$\hat{y}_t = \left(1+\frac{\psi}{\bar{y}}\right)\left(\hat{\varepsilon}_t + \alpha\left(\hat{\tilde{k}}_t - \hat{g}_{zt}\right) + \hat{N}_t\,(1-\alpha)\right) \tag{11}$$

$$\hat{r}_{Kt} = \hat{w}_t + \hat{g}_{zt} + \hat{N}_t - \hat{k}^s_t - \frac{\frac{\nu_K-1}{\nu_K}\left(\frac{1-\alpha_K}{\alpha_K}\right)^{\frac{1}{\nu_K}}\left(\frac{\bar{k}_G}{\bar{k}}\right)^{\frac{\nu_K-1}{\nu_K}}}{1+\left(\frac{1-\alpha_K}{\alpha_K}\right)^{\frac{1}{\nu_K}}\left(\frac{\bar{k}_G}{\bar{k}}\right)^{\frac{\nu_K-1}{\nu_K}}}\left(\hat{k}_{Gt-1} - \hat{k}^s_t\right) \tag{12}$$

$$\hat{mc}_t = (-\hat{\varepsilon}_t) + \hat{r}_{Kt}\,\alpha + \hat{w}_t\,(1-\alpha) + \alpha\,\left(\hat{k}^s_t - \hat{\bar{k}}_t\right) + \left(\hat{k}_{Gt-1} - \hat{k}^s_t\right)\,\frac{\left(\frac{1-\alpha_K}{\alpha_K}\right)^{\frac{1}{\nu_K}}\,\left(\frac{\bar{k}_G}{\bar{k}}\right)^{\frac{\nu_K-1}{\nu_K}}\,\frac{\alpha\,(\nu_K-1)}{\nu_K}}{1+\left(\frac{1-\alpha_K}{\alpha_K}\right)^{\frac{1}{\nu_K}}\,\left(\frac{\bar{k}_G}{\bar{k}}\right)^{\frac{\nu_K-1}{\nu_K}}} \tag{13}$$

$$\hat{\bar{\pi}}^C_t = \rho_{\pi^C}\,\hat{\bar{\pi}}^C_{t-1} + \hat{\bar{\eta}}^C_t \tag{14}$$

$$\begin{aligned}\hat{\pi}_{Ht} - \hat{\bar{\pi}}^C_t = {} & \frac{\beta}{1+\beta\,\chi_H}\,\left(\hat{\pi}_{Ht+1} - \hat{\bar{\pi}}^C_{t+1}\right) + \frac{\chi_H}{1+\beta\,\chi_H}\,\left(\hat{\pi}_{Ht-1} - \hat{\bar{\pi}}^C_t\right) \\ & + \frac{\beta\,\chi_H}{1+\beta\,\chi_H}\,\left(\hat{\bar{\pi}}^C_{t+1} - \hat{\bar{\pi}}^C_t\right) + \frac{(1-\beta\,\theta_H)\,(1-\theta_H)}{(1+\beta\,\chi_H)\,\theta_H}\,(\hat{mc}_t - \hat{p}_{Ht}) + \hat{\phi}^H_t\end{aligned} \tag{15}$$

$$\begin{aligned}\hat{\pi}_{Xt} - \hat{\bar{\pi}}^C_t = {} & \frac{\beta}{1+\beta\,\chi_X}\,\left(\hat{\pi}_{Xt+1} - \hat{\bar{\pi}}^C_{t+1}\right) + \frac{\chi_X}{1+\beta\,\chi_X}\,\left(\hat{\pi}_{Xt-1} - \hat{\bar{\pi}}^C_t\right) \\ & + \left(\hat{\bar{\pi}}^C_{t+1} - \hat{\bar{\pi}}^C_t\right)\,\frac{\beta\,\chi_X}{1+\beta\,\chi_X} + \frac{(1-\beta\,\theta_X)\,(1-\theta_X)}{(1+\beta\,\chi_X)\,\theta_X}\,(\hat{mc}_t - \hat{p}_{Xt}) + \hat{\phi}^X_t\end{aligned} \tag{16}$$

$$\begin{aligned}\hat{\pi}_{IMt} - \hat{\bar{\pi}}^C_t = {} & \frac{\beta}{1+\beta\,\chi^M}\,\left(\hat{\pi}_{IMt+1} - \hat{\bar{\pi}}^C_{t+1}\right) + \frac{\chi^M}{1+\beta\,\chi^M}\,\left(\hat{\pi}_{IMt-1} - \hat{\bar{\pi}}^C_t\right) \\ & + \left(\hat{\bar{\pi}}^C_{t+1} - \hat{\bar{\pi}}^C_t\right)\,\frac{\beta\,\chi^M}{1+\beta\,\chi^M} + \frac{(1-\beta\,\theta_M)\,(1-\theta_M)}{(1+\beta\,\chi^M)\,\theta_M}\,(\hat{s}_t + \hat{p}_{Yt} - \hat{p}_{IMt}) + \hat{\phi}^*_t\end{aligned} \tag{17}$$

$$\hat{c}_t = \bar{\nu}_C^{\frac{1}{\mu_C}}\,\left(\frac{\bar{h}^C}{\bar{q}^C}\right)^{1-\frac{1}{\mu_C}}\,(\hat{c}_t - \hat{p}_{Ht}\,\mu_C) + (1-\bar{\nu}_C)^{\frac{1}{\mu_C}}\,\left(\frac{\bar{im}^C}{\bar{q}^C}\right)^{1-\frac{1}{\mu_C}}\,\hat{im}^C_t \tag{18}$$

$$0 = \hat{p}_{Ht}\,\bar{\nu}_C\,\bar{p}_H^{1-\mu_C} + \hat{p}_{IMt}\,(1-\bar{\nu}_C)\,\bar{p}_{IM}^{1-\mu_C} \tag{19}$$

$$\hat{i}_t = \bar{\nu}_I^{\frac{1}{\mu_I}}\,\left(\frac{\bar{h}^I}{\bar{q}^I}\right)^{1-\frac{1}{\mu_I}}\,\left(\hat{i}_t - \mu_I\,(\hat{p}_{Ht} - \hat{p}_{It})\right) + (1-\bar{\nu}_I)^{\frac{1}{\mu_I}}\,\left(\frac{\bar{im}^I}{\bar{q}^I}\right)^{1-\frac{1}{\mu_I}}\,\hat{im}^I_t \tag{20}$$

$$\hat{p}_{It} = \hat{p}_{Ht}\,\bar{\nu}_I\,\left(\frac{\bar{p}_H}{\bar{p}_I}\right)^{1-\mu_I} + \hat{p}_{IMt}\,(1-\bar{\nu}_I)\,\left(\frac{\bar{p}_{IM}}{\bar{p}_I}\right)^{1-\mu_I} \tag{21}$$

$$\hat{im}_t = \hat{im}^C_t\,\frac{\bar{im}^C}{\bar{im}} + \hat{im}^I_t\,\frac{\bar{im}^I}{\bar{im}} \tag{22}$$

$$\hat{x}_t = (-\mu^*)\,(\hat{p}_{Xt} - \hat{p}_{Yt} - \hat{s}_t) + \hat{y}^*_t + ztilde \tag{23}$$

$$\hat{r}_t = \phi_R\,\hat{r}_{t-1} + (1-\phi_R)\,\left(\hat{\bar{\pi}}^C_t + \phi_\pi\,\left(\hat{\pi}_{Ct} - \hat{\bar{\pi}}^C_t\right) + \phi_{\Delta Y}\,(\hat{y}_t - \hat{y}_{t-1})\right) + \hat{\eta}^R_t \tag{24}$$

$$\hat{y}_t = \frac{\bar{h}}{\bar{y}} \left((\hat{c}_t - \hat{p}_{Ht}\, \mu_C)\ \frac{\bar{h}^C}{\bar{h}} + \left(\hat{i}_t - \mu_I\ (\hat{p}_{Ht} - \hat{p}_{It}) \right)\ \frac{\bar{h}^I}{\bar{h}} + \frac{\bar{h}^G}{\bar{h}}\, \hat{g}_t + \frac{\bar{h}^{I_G}}{\bar{h}}\, \hat{i}_{Gt} \right) + \hat{x}_t\, \frac{\bar{x}}{\bar{y}} \tag{25}$$

$$\begin{aligned} \hat{y}_t + \hat{p}_{Yt} = {} & \hat{c}_t\, \frac{\bar{c}}{\bar{y}\, \bar{p}_Y} + \frac{\bar{p}_I\, \bar{i}}{\bar{y}\, \bar{p}_Y}\ \left(\hat{p}_{It} + \hat{i}_t \right) + \hat{u}_t\, \gamma_{u,1}\, \frac{\bar{p}_I\, \bar{k}}{\bar{y}\, \bar{g}\bar{z}\, \bar{p}_Y} + \frac{\bar{p}_G\, \bar{g}}{\bar{y}\, \bar{p}_Y}\ (\hat{p}_{Ht} + \hat{g}_t) + \frac{\bar{p}_{I_G}\, \bar{i_G}}{\bar{y}\, \bar{p}_Y}\ \left(\hat{p}_{Ht} + \hat{i}_{Gt} \right) \\ & + \frac{\bar{x}\, \bar{p}_X}{\bar{y}\, \bar{p}_Y}\ (\hat{p}_{Xt} + \hat{x}_t) - \frac{\bar{im}^C\, \bar{p}_{IM}}{\bar{y}\, \bar{p}_Y}\ \left(\hat{p}_{IMt} + \hat{im}_t^C \right) - \frac{\bar{p}_{IM}\, \bar{im}^I}{\bar{y}\, \bar{p}_Y}\ \left(\hat{p}_{IMt} + \hat{im}_t^I \right) \end{aligned} \tag{26}$$

$$\begin{aligned} \hat{b}_t^*\ \left(- \left(\frac{1}{\bar{R}^*} \right) \right) + \frac{1}{\bar{gz}\, \bar{\pi}_Y^*}\, \hat{b}_{t-1}^* = {} & \frac{\bar{x}\, \bar{p}_X}{\bar{s}\, \bar{p}_Y}\ (\hat{p}_{Xt} + \hat{x}_t - \hat{s}_t - \hat{p}_{Yt} - ztilde) \\ & - \frac{\bar{p}_{IM}\, \bar{im}}{\bar{s}\, \bar{p}_Y}\ \left(\hat{p}_{IMt} + \hat{im}_t - \hat{s}_t - \hat{p}_{Yt} - ztilde \right) \end{aligned} \tag{27}$$

$$\hat{p}_{Ht} = \hat{\pi}_{Ht} + \hat{p}_{Ht-1} - \hat{\pi}_{Ct} \tag{28}$$

$$\hat{p}_{Xt} = \hat{\pi}_{Xt} + \hat{p}_{Xt-1} - \hat{\pi}_{Ct} \tag{29}$$

$$\hat{p}_{Yt} = \hat{p}_{Yt-1} + \hat{\pi}_{Yt} - \hat{\pi}_{Ct} \tag{30}$$

$$\hat{p}_{It} = \hat{p}_{It-1} + \hat{\pi}_{It} - \hat{\pi}_{Ct} \tag{31}$$

$$\hat{p}_{IMt} = \hat{\pi}_{IMt} + \hat{p}_{IMt-1} - \hat{\pi}_{Ct} \tag{32}$$

$$\begin{aligned} \frac{\bar{p}_G\, \bar{g}}{\bar{y}\, \bar{p}_Y}\ (\hat{p}_{Ht} + \hat{g}_t - \hat{p}_{Yt} - \hat{y}_t) = {} & \frac{\bar{c}}{\bar{y}\, \bar{p}_Y}\ (\hat{\tau}_t^c + \bar{\tau}^c\ (\hat{c}_t - \hat{p}_{Yt} - \hat{y}_t)) + \frac{\bar{w}\, \bar{N}}{\bar{y}\, \bar{p}_Y}\ \left(\hat{\tau}_t^w + \bar{\tau}^w\ \left(\hat{w}_t + \hat{N}_t - \hat{p}_{Yt} - \hat{y}_t \right) \right) \\ & - \frac{\bar{p}_{I_G}\, \bar{i_G}}{\bar{y}\, \bar{p}_Y}\ \left(\hat{p}_{Ht} + \hat{i}_{Gt} - \hat{p}_{Yt} - \hat{y}_t \right) \\ & + \frac{\bar{r}_K\, \bar{k}}{\bar{gz}\, \bar{y}\, \bar{p}_Y}\ \left(\hat{\tau}_t^k + \bar{\tau}^k\ \left(\hat{k}_{t-1} + \hat{r}_{Kt} + \hat{u}_t - \hat{g}_{zt} - \hat{p}_{Yt} - \hat{y}_t \right) \right) \\ & - \frac{\bar{p}_I\, \bar{k}}{\bar{gz}\, \bar{y}\, \bar{p}_Y}\ \left(\delta\, \hat{\tau}_t^k + \hat{u}_t\, \bar{\tau}^k\, \gamma_{u,1} + \delta\, \bar{\tau}^k\ \left(\hat{p}_{It} + \hat{k}_{t-1} - \hat{g}_{zt} - \hat{p}_{Yt} - \hat{y}_t \right) \right) \\ & + \frac{\bar{b}}{\bar{y}\, \bar{p}_Y\, Rgovbar}\ \left(\hat{b}_t - rrp_t - \hat{p}_{Yt} - \hat{y}_t \right) \\ & - \frac{\bar{b}}{\bar{y}\, \bar{p}_Y\, \bar{gz}\, \bar{\pi}}\ \left(\hat{b}_{t-1} - \hat{\pi}_{Ct} - \hat{g}_{zt} - \hat{p}_{Yt} - \hat{y}_t \right) - \frac{\bar{tr}}{\bar{y}\, \bar{p}_Y}\ \left(\hat{tr}_t - \hat{p}_{Yt} - \hat{y}_t \right) \end{aligned} \tag{33}$$

$$\hat{p}_t^{sus} - \hat{y}_t = \hat{b}_{t-1} + rrp_t - (\hat{\pi}_{Yt} + dy_t) - \hat{y}_{t-1} \tag{34}$$

$$\hat{p}_t^{gap} = \hat{p}_t^{bud} - \hat{p}_t^{sus} \tag{35}$$

$$\hat{p}_t^{gapgdp} = \hat{p}_t^{bud} - \hat{p}_t^{sus} - \hat{y}_t \tag{36}$$

$$\begin{aligned}\hat{p}_t^{bud} = {} & \frac{\bar{c}}{\bar{y}\,\bar{p}_Y}\,\left(\hat{\tau}_t^c + \bar{\tau}^c\,\left(\hat{c}_t - \hat{p}_{Yt} - \hat{y}_t\right)\right) + \frac{\bar{w}\,\bar{N}}{\bar{y}\,\bar{p}_Y}\,\left(\hat{\tau}_t^w + \bar{\tau}^w\,\left(\hat{w}_t + \hat{N}_t - \hat{p}_{Yt} - \hat{y}_t\right)\right) \\ & + \frac{\bar{r}_K\,\bar{k}}{\bar{gz}\,\bar{y}\,\bar{p}_Y}\,\left(\hat{\tau}_t^k + \bar{\tau}^k\,\left(\hat{k}_{t-1} + \hat{r}_{Kt} + \hat{u}_t - \hat{g}_{zt} - \hat{p}_{Yt} - \hat{y}_t\right)\right) \\ & - \frac{\bar{p}_G\,\bar{g}}{\bar{y}\,\bar{p}_Y}\,\left(\hat{p}_{Ht} + \hat{g}_t - \hat{p}_{Yt} - \hat{y}_t\right) - \frac{\bar{p}_{I_G}\,\bar{i_G}}{\bar{y}\,\bar{p}_Y}\,\left(\hat{p}_{Ht} + \hat{i}_{Gt} - \hat{p}_{Yt} - \hat{y}_t\right) \\ & - \frac{\bar{p}_I\,\bar{k}}{\bar{gz}\,\bar{y}\,\bar{p}_Y}\,\left(\delta\,\hat{\tau}_t^k + \hat{u}_t\,\bar{\tau}^k\,\gamma_{u,1} + \delta\,\bar{\tau}^k\,\left(\hat{p}_{It} + \hat{k}_{t-1} - \hat{g}_{zt} - \hat{p}_{Yt} - \hat{y}_t\right)\right) - \frac{\bar{tr}}{\bar{y}\,\bar{p}_Y}\,\left(\hat{tr}_t - \hat{p}_{Yt} - \hat{y}_t\right)\end{aligned} \tag{37}$$

$$\hat{\bar{c}}_t^R = \hat{c}_t^R\,{\alpha_G}^{\frac{1}{\nu_G}}\,\left(\frac{\bar{c}^R}{\bar{\bar{c}}^R}\right)^{\frac{\nu_G-1}{\nu_G}} + \hat{g}_t\,{(1-\alpha_G)}^{\frac{1}{\nu_G}}\,\left(\frac{\bar{g}}{\bar{\bar{c}}^R}\right)^{\frac{\nu_G-1}{\nu_G}} \tag{38}$$

$$\hat{\bar{k}}_t = \hat{k}_t^s\,{\alpha_K}^{\frac{1}{\nu_K}}\,\left(\frac{\bar{k}}{\bar{\bar{k}}}\right)^{\frac{\nu_K-1}{\nu_K}} + \hat{k}_{Gt-1}\,{(1-\alpha_K)}^{\frac{1}{\nu_K}}\,\left(\frac{\bar{k}_G}{\bar{\bar{k}}}\right)^{\frac{\nu_K-1}{\nu_K}} \tag{39}$$

$$\hat{k}_{Gt} = \hat{k}_{Gt-1}\,\frac{1-\delta_G}{\bar{gz}} - \hat{g}_{zt}\,\frac{1-\delta_G}{\bar{gz}} + \hat{i}_{Gt}\,\left(1 - \frac{1-\delta_G}{\bar{gz}}\right) + \hat{\varepsilon}_t^i\,\gamma_I\,\bar{gz}^2\,(1+\beta)\,\left(1 - \frac{1-\delta_G}{\bar{gz}}\right) \tag{40}$$

$$\hat{c}_t = \hat{c}_t^R\,\frac{\bar{c}^R\,(1-\omega)}{\bar{c}} + \frac{\omega\,\bar{c}^{NR}}{\bar{c}}\,\hat{c}_t^{NR} \tag{41}$$

$$\hat{tr}_t = \frac{(1-\omega)\,\bar{tr}^R}{\bar{tr}}\,\hat{tr}_t^R + \frac{\omega\,\bar{tr}^{NR}}{\bar{tr}}\,\hat{tr}_t^{NR} \tag{42}$$

$$\hat{tr}_t^R\,tr2rot = \hat{tr}_t^{NR}\,(1 - tr2rot) \tag{43}$$

$$0 = (1+\bar{\tau}^c)\,\bar{c}^{NR}\,\left(\frac{\bar{\tau}^c}{1+\bar{\tau}^c}\,\hat{\tau}_t^c + \hat{c}_t^{NR}\right) - \bar{N}\,(1-\bar{\tau}^w)\,\bar{w}\,\left(\hat{w}_t + \hat{N}_t - \frac{1}{1-\bar{\tau}^w}\,\hat{\tau}_t^w\right) - \bar{tr}^{NR}\,\hat{tr}_t^{NR} \tag{44}$$

$$\hat{\varepsilon}_t^C = \rho_C\,\hat{\varepsilon}_{t-1}^C + etaC_t \tag{45}$$

$$\hat{\varepsilon}_t^N = \rho_N\,\hat{\varepsilon}_{t-1}^N + \hat{\eta}_t^N \tag{46}$$

$$\hat{\varepsilon}_t^{RP} = \rho_{RP}\,\hat{\varepsilon}_{t-1}^{RP} + \hat{\eta}_t^{RP} \tag{47}$$

$$\hat{\varepsilon}_t^{RP^*} = \rho_{RP^*}\,\hat{\varepsilon}_{t-1}^{RP^*} + \hat{\eta}_t^{RP^*} \tag{48}$$

$$\hat{g}_{zt} = \rho_{g_z}\,\hat{g}_{zt-1} + \hat{\eta}_t^{g_z} \tag{49}$$

$$\hat{\varepsilon}_t = \rho_\epsilon\,\hat{\varepsilon}_{t-1} + \hat{\eta}_t^{\varepsilon} \tag{50}$$

$$\hat{\varepsilon}_t^i = \rho_i\,\hat{\varepsilon}_{t-1}^i + \hat{\eta}_t^i \tag{51}$$

$$\hat{\phi}_t^W = \rho_{\phi^W}\,\hat{\phi}_{t-1}^W + \hat{\eta}_t^{\phi^W} \tag{52}$$

$$\hat{\phi}_t^H = \rho_{\phi^H}\,\hat{\phi}_{t-1}^H + \hat{\eta}_t^{\phi^H} \tag{53}$$

$$\hat{\phi}_t^X = \rho_{\phi^X}\,\hat{\phi}_{t-1}^X + \hat{\eta}_t^{\phi^X} \tag{54}$$

$$\hat{\phi}_t^* = \rho_{\phi^*}\,\hat{\phi}_{t-1}^* + \hat{\eta}_t^{\phi^*} \tag{55}$$

$$\hat{g}_t = \rho_g\,\hat{g}_{t-1} - \hat{y}_t\,\theta_{GY} - \hat{b}_{t-1}\,\theta_{GB} + epsilonG_t \tag{56}$$

$$\hat{i}_{Gt} = \rho_{i_G}\,\hat{i}_{Gt-1} - \hat{y}_t\,\theta_{i_GY} - \hat{b}_{t-1}\,\theta_{i_GB} + epsiloniG_t \tag{57}$$

$$\hat{tr}_t = \rho_{tr}\,\hat{tr}_{t-1} - \hat{y}_t\,\theta_{trY} - \hat{b}_{t-1}\,\theta_{trB} + epsilontr_t \tag{58}$$

$$\hat{\tau}_t^c = \rho_{\tau^c}\,\hat{\tau}_{t-1}^c + \hat{b}_{t-1}\,\theta_{\tau^cB} + \hat{y}_t\,\theta_{\tau^cY} + epsilontauC_t \tag{59}$$

$$\hat{\tau}_t^w = \rho_{\tau^w}\,\hat{\tau}_{t-1}^w + \hat{b}_{t-1}\,\theta_{\tau^wB} + \hat{y}_t\,\theta_{\tau^wY} + epsilontauN_t \tag{60}$$

$$\hat{\tau}_t^k = \rho_{\tau^k}\,\hat{\tau}_{t-1}^k + \hat{b}_{t-1}\,\theta_{\tau^kB} + \hat{y}_t\,\theta_{\tau^kY} + epsilontauK_t \tag{61}$$

$$epsilonG_t = rhoepsG\,epsilonG_{t-1} + \hat{\eta}_t^g \tag{62}$$

$$epsiloniG_t = rhoepsiG\,epsiloniG_{t-1} + \hat{\eta}_t^{i_G} \tag{63}$$

$$epsilontr_t = rhoepstr\,epsilontr_{t-1} + \hat{\eta}_t^{tr} \tag{64}$$

$$epsilontauC_t = rhoepstauC\,epsilontauC_{t-1} + \hat{\eta}_t^{\tau^c} \tag{65}$$

$$epsilontauN_t = rhoepstauN\,epsilontauN_{t-1} + \hat{\eta}_t^{\tau^w} \tag{66}$$

$$epsilontauK_t = rhoepstauK\,epsilontauK_{t-1} + \hat{\eta}_t^{\tau^k} \tag{67}$$

$$\hat{\pi}_t^* = \frac{\chi^*}{1+\chi^*\,\beta^*}\,\hat{\pi}_{t-1}^* + \hat{\pi}_{t+1}^*\,\frac{\beta^*}{1+\chi^*\,\beta^*} + \frac{(1-\theta_*)\,(1-\beta^*\,\theta_*)}{(1+\chi^*\,\beta^*)\,\theta_*}\,\left(\hat{y}_t^*\,(\sigma^*+\sigma_n^*) - (1+\sigma_n^*)\,\hat{\varepsilon}_t^{Y^*}\right) \quad (68)$$

$$\hat{y}_t^* = \frac{1}{1+\kappa^*}\,\hat{y}_{t+1}^* + \frac{\kappa^*}{1+\kappa^*}\,\hat{y}_{t-1}^* - \frac{1-\kappa^*}{\sigma^*\,(1+\kappa^*)}\,\left(\hat{\varepsilon}_t^{RP^*} + \hat{r}_t^* - \hat{\pi}_{t+1}^*\right) \quad (69)$$

$$\hat{r}_t^* = \rho_{R^*}\,\hat{r}_{t-1}^* + (1-\rho_{R^*})\,\left(\hat{\pi}_t^*\,kappapistar + kappaystar\,\left(\hat{y}_t^* - \hat{y}_{t-1}^*\right)\right) + epsilonrstar_t \quad (70)$$

$$\hat{\varepsilon}_t^{Y^*} = \rho_{Y^*}\,\hat{\varepsilon}_{t-1}^{Y^*} + \hat{\eta}_t^{y^*} \quad (71)$$

$$\hat{\varepsilon}_t^{\pi^*} = \rho_{\pi^*}\,\hat{\varepsilon}_{t-1}^{\pi^*} + \hat{\eta}_t^{\pi^*} \quad (72)$$

$$epsilonrstar_t = rhoepsrstar\,epsilonrstar_{t-1} + \hat{\eta}_t^{R^*} \quad (73)$$

$$\hat{N}_t + \hat{\varepsilon}_t^N = \hat{E}_t + \frac{\xi_E}{(1-\beta\,\xi_E)\,(1-\xi_E)}\,\left(\hat{E}_t - \hat{E}_{t-1} + \beta\,\left(\hat{E}_t - \hat{E}_{t+1}\right)\right) \quad (74)$$

$$\hat{\pi}_t^w = \hat{w}_t - \hat{w}_{t-1} \quad (75)$$

$$\frac{dy_{-t}}{100} = \hat{g}_{zt} + \hat{y}_t - \hat{y}_{t-1} + log\,(\bar{gz}) \quad (76)$$

$$\frac{dc_{-t}}{100} = \hat{g}_{zt} + \hat{c}_t - \hat{c}_{t-1} + log\,(\bar{gz} + 0.0014) + me\_c_t \quad (77)$$

$$\frac{dg_{-t}}{100} = \hat{g}_{zt} + \hat{g}_t - \hat{g}_{t-1} + log\,(\bar{gz} - 0.0006) \quad (78)$$

$$\frac{db_{-t}}{100} = \hat{g}_{zt} + \hat{b}_t - \hat{b}_{t-1} + log\,(\bar{gz} + 0.00529246) \quad (79)$$

$$\frac{gdebtgdp_{-t}}{100} = \hat{b}_t - \hat{y}_t + 0.41131 + me\_b_t \quad (80)$$

$$\frac{dx_{-t}}{100} = \hat{g}_{zt} + \hat{x}_t - \hat{x}_{t-1} + log\,(\bar{gz} + 0.0002) \quad (81)$$

$$\frac{dim_{-t}}{100} = \hat{g}_{zt} + \hat{im}_t - \hat{im}_{t-1} + log\,(\bar{gz} + 0.0051) \quad (82)$$

$$\frac{dE_{-t}}{100} = \hat{E}_t - \hat{E}_{t-1} + 0.0015178474864644 71 + me\_E_t \quad (83)$$

$$\frac{dw_{-t}}{100} = \hat{g}_{zt} + \hat{w}_t - \hat{w}_{t-1} + 0.004903259352432507 + me\_w_t \tag{84}$$

$$\frac{R_{-t}}{100} = \hat{r}_t + log\left(\bar{R}\right) \tag{85}$$

$$\frac{di_{-t}}{100} = \hat{g}_{zt} + \hat{i}_t - \hat{i}_{t-1} + 0.01084270484626005 + me\_i_t \tag{86}$$

$$\frac{diG_{-t}}{100} = \hat{g}_{zt} + \hat{i}_{Gt} - \hat{i}_{Gt-1} + 0.0104254654835828 \tag{87}$$

$$\frac{dtr_{-t}}{100} = \hat{g}_{zt} + \hat{tr}_t - \hat{tr}_{t-1} + 0.01618924413810592 \tag{88}$$

$$\frac{pi\_im_{-t}}{100} = \hat{\pi}_{IMt} + log\left(\bar{\pi}\right) + me\_pi\_im_t \tag{89}$$

$$\frac{pi\_x_{-t}}{100} = \hat{\pi}_{Xt} + log\left(\bar{\pi}\right) + me\_pi\_x_t \tag{90}$$

$$\frac{pi\_c_{-t}}{100} = \hat{\pi}_{Ct} + log\left(\bar{\pi}\right) \tag{91}$$

$$\frac{pi\_cbar_{-t}}{100} = \hat{\bar{\pi}}_t^C + log\left(\bar{\pi}\right) \tag{92}$$

$$\frac{pi\_h_{-t}}{100} = \hat{\pi}_{Ht} + log\left(\bar{\pi}\right) \tag{93}$$

$$\frac{dtauC_{-t}}{100} = \hat{\tau}_t^c - \hat{\tau}_{t-1}^c + 0.0001099939504436846 \tag{94}$$

$$\frac{dtauN_{-t}}{100} = \hat{\tau}_t^w - \hat{\tau}_{t-1}^w + 0.000423010518433776 \tag{95}$$

$$\frac{dtauK_{-t}}{100} = \hat{\tau}_t^k - \hat{\tau}_{t-1}^k + 0.0008113707497113416 \tag{96}$$

$$\frac{dy\_star_{-t}}{100} = \hat{y}_t^* - \hat{y}_{t-1}^* + 0.007055054473677037 + me\_Ystar_t \tag{97}$$

$$\frac{R\_star_{-t}}{100} = \hat{r}_t^* + log\left(\bar{R}^*\right) + me\_Rstar_t \tag{98}$$

$$\frac{pi\_Ystar_{-t}}{100} = \hat{\pi}_t^* + log\left(\hat{\bar{\pi}}^*\right) + me\_piYstar_t \tag{99}$$

$$\frac{dsr_{-t}}{100} = \hat{s}_t - \hat{s}_{t-1} + 0.002382808854793512 \tag{100}$$

$$dy_t = \hat{y}_t - \hat{y}_{t-1} \tag{101}$$

$$rrp_t = \hat{r}_t + \hat{\varepsilon}_t^{RP} + \left(\hat{b}_t - \hat{y}_t\right)\ \gamma_B \tag{102}$$

$$rrpstar_t = \hat{r}_t^* + \hat{\varepsilon}_t^{RP^*} + \frac{\gamma_{B^*}\, lamRPstar\, \bar{s}}{\bar{y}}\ \left(\hat{b}_t^* - \hat{y}_t\right) \tag{103}$$

$$by_t = \hat{b}_t - \hat{y}_t \tag{104}$$

$$\hat{\eta}_t^{y^*} = etaobsYstar_t \tag{105}$$

$$0 = etaobsPiYstar_t \tag{106}$$

$$\hat{\eta}_t^{R^*} = etaobsRstar_t \tag{107}$$

$$\hat{\eta}_t^{g} = etaobsg_t \tag{108}$$

$$\hat{\eta}_t^{i_G} = etaobsiG_t \tag{109}$$

$$\hat{\eta}_t^{tr} = etaobstr_t \tag{110}$$

$$\hat{\eta}_t^{R} = etaobsR_t \tag{111}$$

$$\hat{\eta}_t^{RP} = etaobsRPG_t \tag{112}$$

$$\hat{\eta}_t^{RP^*} = etaobsRPstar_t \tag{113}$$

$$\hat{\eta}_t^{g_z} = etaobsgz_t \tag{114}$$

$$\hat{\eta}_t^{\varepsilon} = etaobsepsilon_t \tag{115}$$

$$\hat{\eta}_t^{N} = etaobsN_t \tag{116}$$

$$etaC_t = etaobsC_t \tag{117}$$

$$\hat{\eta}_t^i = etaobsI_t \tag{118}$$

$$\hat{\eta}_t^{\phi^H} = etaobsvarphiH_t \tag{119}$$

$$\hat{\eta}_t^{\phi^X} = etaobsvarphiX_t \tag{120}$$

$$\hat{\eta}_t^{\phi^*} = etaobsvarphistar_t \tag{121}$$

$$\hat{\eta}_t^{\phi^W} = etaobsvarphiW_t \tag{122}$$

$$\hat{\eta}_t^{\tau^c} = etaobstauC_t \tag{123}$$

$$\hat{\eta}_t^{\tau^w} = etaobstauN_t \tag{124}$$

$$\hat{\eta}_t^{\tau^k} = etaobstauK_t \tag{125}$$

$$\hat{\bar{\eta}}_t^C = etaobspiCbar_t \tag{126}$$

$$me\_E_t = meobs\_E_t \tag{127}$$

$$me\_w_t = meobs\_w_t \tag{128}$$

$$me\_pi\_im_t = meobs\_pi\_im_t \tag{129}$$

$$me\_pi\_x_t = meobs\_pi\_x_t \tag{130}$$

$$me\_b_t = meobs\_b_t \tag{131}$$

Table 1: Endogenous

Variable	LaTeX	Description
piC	$\hat{\pi}_C$	piC
piI	$\hat{\pi}_I$	piI
piH	$\hat{\pi}_H$	piH
piIM	$\hat{\pi}_{IM}$	piIM
piX	$\hat{\pi}_X$	piX
piY	$\hat{\pi}_Y$	piY
piCbar	$\hat{\bar{\pi}}^C$	piCbar
mc	$\hat{mc}$	mc
rK	$\hat{r}_K$	rK
w	$\hat{w}$	w
N	$\hat{N}$	N
k	$\hat{k}$	k
kS	$\hat{k}^s$	kS
kG	$\hat{k}_G$	kG
ktilde	$\hat{\tilde{k}}$	ktilde
u	$\hat{u}$	u
y	$\hat{y}$	y
c	$\hat{c}$	c
cI	$\hat{c}^R$	cI
cJ	$\hat{c}^{NR}$	cJ
i	$\hat{i}$	i
iG	$\hat{i}_G$	iG
im	$\hat{im}$	im
imC	$\hat{im}^C$	imC
imI	$\hat{im}^I$	imI
x	$\hat{x}$	x
cItilde	$\hat{\tilde{c}}^R$	cItilde
r	$\hat{r}$	r
g	$\hat{g}$	g
tr	$\hat{tr}$	tr
trI	$\hat{tr}^R$	trI
trJ	$\hat{tr}^{NR}$	trJ
tauC	$\hat{\tau}^c$	tauC
tauK	$\hat{\tau}^k$	tauK
tauN	$\hat{\tau}^w$	tauN
b	$\hat{b}$	b
pbud	$\hat{p}^{bud}$	pbud
pbudsus	$\hat{p}^{sus}$	pbudsus
susgap	$\hat{p}^{gap}$	susgap
susgapgdp	$\hat{p}^{gapgdp}$	susgapgdp
by	$\frac{b}{y}$	by
ystar	$\hat{y}^*$	ystar

Table 1 – Continued

Variable	LaTeX	Description
rstar	$\hat{r}^*$	rstar
piYstar	$\hat{\pi}^*$	piYstar
bstar	$\hat{b}^*$	bstar
epsilonrstar	$epsilonrstar$	epsilonrstar
pY	$\hat{p}_Y$	pY
pIM	$\hat{p}_{IM}$	pIM
pI	$\hat{p}_I$	pI
pH	$\hat{p}_H$	pH
pX	$\hat{p}_X$	pX
lambda	$\hat{\lambda}$	lambda
Q	$\hat{Q}$	Q
s	$\hat{s}$	s
gz	$\hat{g}_z$	gz
epsilonRPG	$\hat{\varepsilon}^{RP}$	epsilonRPG
epsilonRPstar	$\hat{\varepsilon}^{RP^*}$	epsilonRPstar
epsilon	$\hat{\varepsilon}$	epsilon
epsilonN	$\hat{\varepsilon}^N$	epsilonN
epsilonC	$\hat{\varepsilon}^C$	epsilonC
epsilonI	$\hat{\varepsilon}^i$	epsilonI
epsilonYstar	$\hat{\varepsilon}^{Y^*}$	epsilonYstar
epsilonpiYstar	$\hat{\varepsilon}^{\pi^*}$	epsilonpiYstar
varphiW	$\hat{\phi}^W$	varphiW
varphiH	$\hat{\phi}^H$	varphiH
varphiX	$\hat{\phi}^X$	varphiX
varphistar	$\hat{\phi}^*$	varphistar
E	$\hat{E}$	E
epsilonG	$epsilonG$	epsilonG
epsiloniG	$epsiloniG$	epsiloniG
epsilontr	$epsilontr$	epsilontr
epsilontauC	$epsilontauC$	epsilontauC
epsilontauN	$epsilontauN$	epsilontauN
epsilontauK	$epsilontauK$	epsilontauK
piW	$\hat{\pi}^w$	piW
dy	dy	dy
rrp	rrp	rrp
rrpstar	$rrpstar$	rrpstar
dy_	$dy\_$	dy_
dc_	$dc\_$	dc_
dg_	$dg\_$	dg_
db_	$db\_$	db_
gdebtgdp_	$gdebtgdp\_$	gdebtgdp_
dx_	$dx\_$	dx_
dim_	$dim\_$	dim_
dsr_	$dsr\_$	dsr_

Table 1 – Continued

Variable	LaTeX	Description
dE_	$dE\_$	dE_
dw_	$dw\_$	dw_
R_	$R\_$	R_
di_	$di\_$	di_
diG_	$diG\_$	diG_
dtr_	$dtr\_$	dtr_
pi_im_	$pi\_im\_$	pi_im_
pi_x_	$pi\_x\_$	pi_x_
pi_c_	$pi\_c\_$	pi_c_
pi_cbar_	$pi\_cbar\_$	pi_cbar_
pi_h_	$pi\_h\_$	pi_h_
dtauC_	$dtauC\_$	dtauC_
dtauN_	$dtauN\_$	dtauN_
dtauK_	$dtauK\_$	dtauK_
dy_star_	$dy\_star\_$	dy_star_
R_star_	$R\_star\_$	R_star_
pi_Ystar_	$pi\_Ystar\_$	pi_Ystar_
etaobsYstar	$etaobsYstar$	etaobsYstar
etaobsPiYstar	$etaobsPiYstar$	etaobsPiYstar
etaobsRstar	$etaobsRstar$	etaobsRstar
etaobsg	$etaobsg$	etaobsg
etaobsiG	$etaobsiG$	etaobsiG
etaobstr	$etaobstr$	etaobstr
etaobsR	$etaobsR$	etaobsR
etaobsRPG	$etaobsRPG$	etaobsRPG
etaobsRPstar	$etaobsRPstar$	etaobsRPstar
etaobsgz	$etaobsgz$	etaobsgz
etaobsepsilon	$etaobsepsilon$	etaobsepsilon
etaobsN	$etaobsN$	etaobsN
etaobsC	$etaobsC$	etaobsC
etaobsI	$etaobsI$	etaobsI
etaobsvarphiH	$etaobsvarphiH$	etaobsvarphiH
etaobsvarphiX	$etaobsvarphiX$	etaobsvarphiX
etaobsvarphistar	$etaobsvarphistar$	etaobsvarphistar
etaobsvarphiW	$etaobsvarphiW$	etaobsvarphiW
etaobstauC	$etaobstauC$	etaobstauC
etaobstauN	$etaobstauN$	etaobstauN
etaobstauK	$etaobstauK$	etaobstauK
etaobspiCbar	$etaobspiCbar$	etaobspiCbar
meobs_E	$meobs\_E$	meobs_E
meobs_w	$meobs\_w$	meobs_w
meobs_pi_im	$meobs\_pi\_im$	meobs_pi_im
meobs_pi_x	$meobs\_pi\_x$	meobs_pi_x
meobs_b	$meobs\_b$	meobs_b

Table 2: Exogenous

Variable	LaTeX	Description
etag	$\hat{\eta}^{g}$	etag
etaiG	$\hat{\eta}^{i_G}$	etaiG
etatr	$\hat{\eta}^{tr}$	etatr
etatauC	$\hat{\eta}^{\tau^c}$	etatauC
etatauN	$\hat{\eta}^{\tau^w}$	etatauN
etatauK	$\hat{\eta}^{\tau^k}$	etatauK
etaYstar	$\hat{\eta}^{y^*}$	etaYstar
etaPiYstar	$\hat{\eta}^{\pi^*}$	etaPiYstar
etaRstar	$\hat{\eta}^{R^*}$	etaRstar
etagz	$\hat{\eta}^{g_z}$	etagz
etaepsilon	$\hat{\eta}^{\varepsilon}$	etaepsilon
etaN	$\hat{\eta}^{N}$	etaN
etaC	$etaC$	etaC
etaI	$\hat{\eta}^{i}$	etaI
etavarphiH	$\hat{\eta}^{\phi^H}$	etavarphiH
etavarphiX	$\hat{\eta}^{\phi^X}$	etavarphiX
etavarphistar	$\hat{\eta}^{\phi^*}$	etavarphistar
etavarphiW	$\hat{\eta}^{\phi^W}$	etavarphiW
etaR	$\hat{\eta}^{R}$	etaR
etaRPG	$\hat{\eta}^{RP}$	etaRPG
etaRPstar	$\hat{\eta}^{RP^*}$	etaRPstar
etapiCbar	$\hat{\bar{\eta}}^{C}$	etapiCbar
me_c	me_c	me_c
me_E	me_E	me_E
me_w	me_w	me_w
me_i	me_i	me_i
me_pi_im	me_pi_im	me_pi_im
me_pi_x	me_pi_x	me_pi_x
me_b	me_b	me_b
me_piYstar	$me\_piYstar$	me_piYstar
me_Ystar	me_Ystar	me_Ystar
me_Rstar	me_Rstar	me_Rstar

Table 3: Parameters

Variable	LaTeX	Description
ztilde	$ztilde$	ztilde
rhoepsG	$rhoepsG$	rhoepsG
rhoepsiG	$rhoepsiG$	rhoepsiG

Table 3 – Continued

Variable	LaTeX	Description
rhoepstr	$rhoepstr$	rhoepstr
rhoepstauC	$rhoepstauC$	rhoepstauC
rhoepstauN	$rhoepstauN$	rhoepstauN
rhoepstauK	$rhoepstauK$	rhoepstauK
Rbar	$\bar{R}$	Rbar
kappa	κ	kappa
chiW	χ_W	chiW
chiH	χ_H	chiH
chiX	χ_X	chiX
chiM	χ^M	chiM
thetaW	θ_W	thetaW
thetaH	θ_H	thetaH
thetaX	θ_X	thetaX
thetaM	θ_M	thetaM
varphiWbar	$\bar{\phi}^W$	varphiWbar
varphiHbar	$\bar{\phi}^H$	varphiHbar
sigmaL	σ_L	sigmaL
psi	ψ	psi
omega	ω	omega
gammaI	γ_I	gammaI
gammaB	γ_B	gammaB
gammaBstar	γ_{B^*}	gammaBstar
gammau2	$\gamma_{u,2}$	gammau2
gammau1	$\gamma_{u,1}$	gammau1
betta	β	betta
betastar	β^*	betastar
alfa	α	alfa
alphaG	α_G	alphaG
alphaK	α_K	alphaK
nuG	ν_G	nuG
nuK	ν_K	nuK
delta	δ	delta
deltaG	δ_G	deltaG
phiR	ϕ_R	phiR
phiPi	ϕ_π	phiPi
phiY	ϕ_Y	phiY
phiDPi	$\phi_{\Delta\pi}$	phiDPi
phiDY	$\phi_{\Delta Y}$	phiDY
PiYstarbar	$\bar{\pi}_Y^*$	PiYstarbar
Pibar	$\bar{\pi}$	Pibar
rKbar	$\bar{r}_K$	rKbar
Rstarbar	$\bar{R}^*$	Rstarbar
pIbar	$\bar{p}_I$	pIbar
pHbar	$\bar{p}_H$	pHbar
pIMbar	$\bar{p}_{IM}$	pIMbar

Table 3 – Continued

Variable	LaTeX	Description
pCbar	$\bar{p}_C$	pCbar
pYbar	$\bar{p}_Y$	pYbar
pGbar	$\bar{p}_G$	pGbar
pIGbar	$\bar{p}_{I_G}$	pIGbar
pXbar	$\bar{p}_X$	pXbar
tauCbar	$\bar{\tau}^c$	tauCbar
tauKbar	$\bar{\tau}^k$	tauKbar
tauNbar	$\bar{\tau}^w$	tauNbar
trJbar	$\bar{tr}^{NR}$	trJbar
trIbar	$\bar{tr}^R$	trIbar
trbar	$\bar{tr}$	trbar
gzbar	$\bar{gz}$	gzbar
sbar	$\bar{s}$	sbar
ybar	$\bar{y}$	ybar
kbar	$\bar{k}$	kbar
ktildebar	$\bar{\tilde{k}}$	ktildebar
kSbar	$\bar{k}^s$	kSbar
kGbar	$\bar{k}_G$	kGbar
ibar	$\bar{i}$	ibar
cbar	$\bar{c}$	cbar
cIbar	$\bar{c}^R$	cIbar
cJbar	$\bar{c}^{NR}$	cJbar
cItildebar	$\bar{\tilde{c}}^R$	cItildebar
gbar	$\bar{g}$	gbar
iGbar	$\bar{i}_G$	iGbar
bbar	$\bar{b}$	bbar
nuCbar	$\bar{\nu}_C$	nuCbar
nuIbar	$\bar{\nu}_I$	nuIbar
muC	μ_C	muC
muI	μ_I	muI
mustar	μ^*	mustar
hbar	$\bar{h}$	hbar
hCbar	$\bar{h}^C$	hCbar
hIbar	$\bar{h}^I$	hIbar
hGbar	$\bar{h}^G$	hGbar
hIGbar	$\bar{h}^{I_G}$	hIGbar
imCbar	$\bar{im}^C$	imCbar
imIbar	$\bar{im}^I$	imIbar
xbar	$\bar{x}$	xbar
qCbar	$\bar{q}^C$	qCbar
qIbar	$\bar{q}^I$	qIbar
imbar	$\bar{im}$	imbar
wbar	$\bar{w}$	wbar
Nbar	$\bar{N}$	Nbar

Table 3 – Continued

Variable	LaTeX	Description
xiE	ξ_E	xiE
rhoRPG	ρ_{RP}	rhoRPG
rhoRPstar	ρ_{RP^*}	rhoRPstar
rhogz	ρ_{g_z}	rhogz
rhoepsilon	ρ_ϵ	rhoepsilon
rhoI	ρ_i	rhoI
rhoIM	ρ_{im}	rhoIM
rhoX	ρ_x	rhoX
rhovarphiW	ρ_{ϕ^W}	rhovarphiW
rhovarphiH	ρ_{ϕ^H}	rhovarphiH
rhovarphiX	ρ_{ϕ^X}	rhovarphiX
rhovarphistar	ρ_{ϕ^*}	rhovarphistar
rhopiC	ρ_{π^C}	rhopiC
rhoC	ρ_C	rhoC
rhoN	ρ_N	rhoN
rhog	ρ_g	rhog
thetaGB	θ_{GB}	thetaGB
thetaGY	θ_{GY}	thetaGY
rhoiG	ρ_{i_G}	rhoiG
thetaiGB	$\theta_{i_G B}$	thetaiGB
thetaiGY	$\theta_{i_G Y}$	thetaiGY
rhotr	ρ_{tr}	rhotr
thetatrB	θ_{trB}	thetatrB
thetatrY	θ_{trY}	thetatrY
rhotauC	ρ_{τ^c}	rhotauC
thetatauCB	$\theta_{\tau^c B}$	thetatauCB
thetatauCY	$\theta_{\tau^c Y}$	thetatauCY
rhotauN	ρ_{τ^w}	rhotauN
thetatauNB	$\theta_{\tau^w B}$	thetatauNB
thetatauNY	$\theta_{\tau^w Y}$	thetatauNY
rhotauK	ρ_{τ^k}	rhotauK
thetatauKB	$\theta_{\tau^k B}$	thetatauKB
thetatauKY	$\theta_{\tau^k Y}$	thetatauKY
sigmastar	σ^*	sigmastar
kappastar	κ^*	kappastar
sigmastarn	σ_n^*	sigmastarn
thetastar	θ_*	thetastar
chistar	χ^*	chistar
rhorstar	ρ_{R^*}	rhorstar
rhopiYstar	ρ_{π^*}	rhopiYstar
rhoYstar	ρ_{Y^*}	rhoYstar
rhopiYstarpiYstar	ρ_{π^*,π^*}	rhopiYstarpiYstar
rhopiYstarYstar	ρ_{π^*,Y^*}	rhopiYstarYstar
piYstarbar	$\hat{\bar{\pi}}^*$	piYstarbar
rhoepsrstar	$rhoepsrstar$	rhoepsrstar

Table 3 – Continued

Variable	LaTeX	Description
kappapistar	$kappapistar$	kappapistar
kappaystar	$kappaystar$	kappaystar
epsRPstarbar	$epsRPstarbar$	epsRPstarbar
lamRPstar	$lamRPstar$	lamRPstar
tauNrevYbar_target	$tauNrevYbar\_target$	tauNrevYbar_target
tauCrevYbar_target	$tauCrevYbar\_target$	tauCrevYbar_target
tauKrevYbar_target	$tauKrevYbar\_target$	tauKrevYbar_target
tauKrevYbar	$tauKrevYbar$	tauKrevYbar
tauNrevYbar	$tauNrevYbar$	tauNrevYbar
tauCrevYbar	$tauCrevYbar$	tauCrevYbar
given_alphaG	$given\_alphaG$	given_alphaG
given_alphaK	$given\_alphaK$	given_alphaK
alphaG_target	$alphaG\_target$	alphaG_target
alphaK_target	$alphaK\_target$	alphaK_target
cJcISSratio	$cJcISSratio$	cJcISSratio
cJcIbar	$cJcIbar$	cJcIbar
tr2rot	$tr2rot$	tr2rot
trJtrIbar	$trJtrIbar$	trJtrIbar
sC	sC	sC
sIMC	$sIMC$	sIMC
sIMI	$sIMI$	sIMI
sX	sX	sX
sI	sI	sI
sG	sG	sG
sIG	sIG	sIG
sTR	sTR	sTR
sBbar	$sBbar$	sBbar
GovRSpread	$GovRSpread$	GovRSpread
epsRPGbar	$epsRPGbar$	epsRPGbar
CorpGovSpread	$CorpGovSpread$	CorpGovSpread
epsRPKbar	$epsRPKbar$	epsRPKbar
Rgovbar	$Rgovbar$	Rgovbar

Table 4: Parameter Values

Parameter	**Value**
$ztilde$	0.000
$rhoepsG$	0.751
$rhoepsiG$	0.721
$rhoepstr$	0.490
$rhoepstauC$	0.429
$rhoepstauN$	0.473
$rhoepstauK$	0.373
$\bar{R}$	1.024
κ	0.951
χ_W	0.512
χ_H	0.518
χ_X	0.685
χ^M	0.643
θ_W	0.483
θ_H	0.730
θ_X	0.747
θ_M	0.776
$\bar{\phi}^W$	1.050
$\bar{\phi}^H$	1.100
σ_L	2.997
ψ	0.372
ω	0.104
γ_I	8.000
γ_B	0.038
γ_{B^*}	0.010
$\gamma_{u,2}$	0.005
$\gamma_{u,1}$	0.045
β	0.994
β^*	0.994
α	0.300
α_G	0.750
α_K	0.900
ν_G	1.000
ν_K	1.000
δ	0.015
δ_G	0.008
ϕ_R	0.872
ϕ_π	1.567
ϕ_Y	0.161
$\phi_{\Delta\pi}$	0.025
$\phi_{\Delta Y}$	0.387
$\bar{\pi}^*_Y$	1.005
$\bar{\pi}$	1.011

Table 4 – Continued

Parameter	Value
$\bar{r}_K$	0.045
$\bar{R}^*$	1.011
$\bar{p}_I$	1.000
$\bar{p}_H$	1.000
$\bar{p}_{IM}$	1.000
$\bar{p}_C$	1.000
$\bar{p}_Y$	1.000
$\bar{p}_G$	1.000
$\bar{p}_{I_G}$	1.000
$\bar{p}_X$	1.000
$\bar{\tau}^c$	0.167
$\bar{\tau}^k$	0.203
$\bar{\tau}^w$	0.191
$\bar{tr}^{NR}$	0.099
$\bar{tr}^R$	0.163
$\bar{tr}$	0.156
$\bar{gz}$	1.007
$\bar{s}$	1.000
$\bar{y}$	3.716
$\bar{k}$	21.768
$\bar{\tilde{k}}$	28.940
$\bar{k}^s$	21.768
$\bar{k}_G$	14.551
$\bar{i}$	0.468
$\bar{c}$	2.312
$\bar{c}^R$	2.361
$\bar{c}^{NR}$	1.888
$\bar{\tilde{c}}^R$	3.083
$\bar{g}$	0.725
$\bar{i_G}$	0.212
$\bar{b}$	7.433
$\bar{\nu}_C$	0.640
$\bar{\nu}_I$	0.524
μ_C	1.388
μ_I	1.500
μ^*	0.633
$\bar{h}$	2.661
$\bar{h}^C$	1.479
$\bar{h}^I$	0.245
$\bar{h}^G$	0.725
$\bar{h}^{I_G}$	0.212
$\bar{im}^C$	0.832
$\bar{im}^I$	0.223

Table 4 – Continued

Parameter	Value
$\bar{x}$	1.055
$\bar{q}^C$	2.312
$\bar{q}^I$	0.468
$\bar{im}$	1.055
$\bar{w}$	1.437
$\bar{N}$	1.772
ξ_E	0.579
ρ_{RP}	0.690
ρ_{RP^*}	0.843
ρ_{g_z}	0.634
ρ_ϵ	0.742
ρ_i	0.673
ρ_{im}	0.900
ρ_x	0.900
ρ_{ϕ^W}	0.566
ρ_{ϕ^H}	0.485
ρ_{ϕ^X}	0.657
ρ_{ϕ^*}	0.557
ρ_{π^C}	0.000
ρ_C	0.890
ρ_N	0.747
ρ_g	0.873
θ_{GB}	0.181
θ_{GY}	0.110
ρ_{i_G}	0.745
θ_{i_GB}	0.568
θ_{i_GY}	0.195
ρ_{tr}	0.499
θ_{trB}	0.477
θ_{trY}	0.189
ρ_{τ^c}	0.309
θ_{τ^cB}	0.196
θ_{τ^cY}	0.204
ρ_{τ^w}	0.340
θ_{τ^wB}	0.255
θ_{τ^wY}	0.175
ρ_{τ^k}	0.369
θ_{τ^kB}	0.174
θ_{τ^kY}	0.530
σ^*	1.482
κ^*	0.500
σ_n^*	1.500
θ_*	0.700
χ^*	0.200

Table 4 – Continued

Parameter	Value
ρ_{R^*}	0.901
ρ_{π^*}	0.000
ρ_{Y^*}	0.968
ρ_{π^*,π^*}	0.994
ρ_{π^*,Y^*}	0.194
$\hat{\bar{\pi}}^*$	1.005
$rhoepsrstar$	0.509
$kappapistar$	1.500
$kappaystar$	0.125
$epsRPstarbar$	1.000
$lamRPstar$	1.000
$tauNrevYbar\_target$	0.134
$tauCrevYbar\_target$	0.104
$tauKrevYbar\_target$	0.037
$tauKrevYbar$	0.036
$tauNrevYbar$	0.131
$tauCrevYbar$	0.104
$given\_alphaG$	1.000
$given\_alphaK$	1.000
$alphaG\_target$	0.750
$alphaK\_target$	0.900
$cJcISSratio$	0.800
$cJcIbar$	0.800
$tr2rot$	0.689
$trJtrIbar$	0.610
sC	0.622
$sIMC$	0.224
$sIMI$	0.060
sX	0.284
sI	0.126
sG	0.195
sIG	0.057
sTR	0.042
$sBbar$	2.000
$GovRSpread$	0.000
$epsRPGbar$	1.000
$CorpGovSpread$	4.656
$epsRPKbar$	0.989
$Rgovbar$	1.024

$$\hat{\lambda} = \frac{\frac{\kappa}{\bar{g}z}}{1-\frac{\kappa}{\bar{g}z}}\,\hat{c}^R - \hat{c}^R\,\frac{1}{1-\frac{\kappa}{\bar{g}z}} - \frac{\frac{\kappa}{\bar{g}z}}{1-\frac{\kappa}{\bar{g}z}}\,\hat{g}_z - \frac{\bar{\tau}^c}{1+\bar{\tau}^c}\,\hat{\tau}^c + \frac{1}{\nu_G}\,\left(\hat{\tilde{c}}^R - \hat{c}^R\right) + \hat{\varepsilon}^C \tag{132}$$

$$\hat{p}_I = \hat{Q} + \gamma_I\,\bar{g}z^2\,\left(1+\beta\right)\,\hat{\varepsilon}^i + \gamma_I\,\bar{g}z^2\,\left(\hat{g}_z\,\beta - \hat{g}_z\right) \tag{133}$$

$$\begin{aligned}\hat{Q} = \hat{\lambda} + \hat{Q}\,\frac{\beta\,\left(1-\delta\right)\,epsRPKbar}{\bar{g}z} - \hat{\lambda} - \hat{g}_z \\ - epsRPKbar\,\frac{\frac{\beta\left(1-\bar{\tau}^k\right)\bar{r}_K}{\bar{g}z}}{\bar{p}_I}\,\left(\frac{1}{1-\bar{\tau}^k}\,\hat{\tau}^k - \hat{r}_K - \hat{u}\right) + epsRPKbar\,\frac{\bar{p}_I\,\beta\,\delta}{\bar{g}z}\,\left(\hat{\tau}^k + \hat{p}_I\,\bar{\tau}^k\right)\end{aligned} \tag{134}$$

$$\hat{\lambda} = \hat{\lambda} - \hat{g}_z + rrp - \hat{\pi}_C \tag{135}$$

$$rrp = \hat{\pi}_Y - \hat{\pi}^* + \hat{r}^* + \hat{\varepsilon}^{RP^*} + \frac{\gamma_{B^*}\,lamRPstar\,\bar{s}}{\bar{y}}\,\left(\hat{b}^* - \hat{y}\right) \tag{136}$$

$$\hat{k} = \hat{k}\,\frac{1-\delta}{\bar{g}z} - \hat{g}_z\,\frac{1-\delta}{\bar{g}z} + \hat{\varepsilon}^i\,\gamma_I\,\bar{g}z^2\,\left(1+\beta\right)\,\left(1-\frac{1-\delta}{\bar{g}z}\right) + \hat{i}\,\left(1-\frac{1-\delta}{\bar{g}z}\right) \tag{137}$$

$$\hat{r}_K = \hat{p}_I + \hat{u}\,\frac{\gamma_{u,2}}{\gamma_{u,1}} \tag{138}$$

$$\hat{k}^s = \hat{u} + \hat{k} \tag{139}$$

$$\begin{aligned}\hat{w} = \hat{w}\,\frac{\beta}{1+\beta} + \hat{w}\,\frac{1}{1+\beta} + \hat{\pi}_C\,\frac{\beta}{1+\beta} - \hat{\pi}_C\,\frac{1+\beta\,\chi_W}{1+\beta} + \hat{\pi}_C\,\frac{\chi_W}{1+\beta} - \frac{\beta\,\left(1-\chi_W\right)}{1+\beta}\,\hat{\bar{\pi}}^C + \hat{\bar{\pi}}^C\,\frac{1-\chi_W}{1+\beta} \\ - \frac{1}{1+\beta}\,\left(\hat{g}_z - \hat{g}_z\,\beta\right) - \frac{\left(1-\beta\,\theta_W\right)\,\left(1-\theta_W\right)}{\left(1+\beta\right)\,\theta_W\,\left(1+\frac{\bar{\phi}^W}{\bar{\phi}^W-1}\,\sigma_L\right)}\,\left(\hat{w} - \frac{1}{1-\bar{\tau}^w}\,\hat{\tau}^w - \left(\sigma_L\,\left(\hat{N} + \hat{\varepsilon}^N\right) - \hat{\lambda}\right)\right) + \hat{\phi}^W\end{aligned} \tag{140}$$

$$\hat{y} = \left(1+\frac{\psi}{\bar{y}}\right)\,\left(\hat{\varepsilon} + \alpha\,\left(\hat{\tilde{k}} - \hat{g}_z\right) + \hat{N}\,\left(1-\alpha\right)\right) \tag{141}$$

$$\hat{r}_K = \hat{w} + \hat{g}_z + \hat{N} - \hat{k}^s - \frac{\frac{\nu_K-1}{\nu_K}\,\left(\frac{1-\alpha_K}{\alpha_K}\right)^{\frac{1}{\nu_K}}\,\left(\frac{\bar{k}_G}{\bar{k}}\right)^{\frac{\nu_K-1}{\nu_K}}}{1+\left(\frac{1-\alpha_K}{\alpha_K}\right)^{\frac{1}{\nu_K}}\,\left(\frac{\bar{k}_G}{\bar{k}}\right)^{\frac{\nu_K-1}{\nu_K}}}\,\left(\hat{k}_G - \hat{k}^s\right) \tag{142}$$

$$\hat{mc} = \left(-\hat{\varepsilon}\right) + \hat{r}_K\,\alpha + \hat{w}\,\left(1-\alpha\right) + \alpha\,\left(\hat{k}^s - \hat{\tilde{k}}\right) + \left(\hat{k}_G - \hat{k}^s\right)\,\frac{\left(\frac{1-\alpha_K}{\alpha_K}\right)^{\frac{1}{\nu_K}}\,\left(\frac{\bar{k}_G}{\bar{k}}\right)^{\frac{\nu_K-1}{\nu_K}}\,\frac{\alpha\,\left(\nu_K-1\right)}{\nu_K}}{1+\left(\frac{1-\alpha_K}{\alpha_K}\right)^{\frac{1}{\nu_K}}\,\left(\frac{\bar{k}_G}{\bar{k}}\right)^{\frac{\nu_K-1}{\nu_K}}} \tag{143}$$

$$\hat{\bar{\pi}}^C = \hat{\bar{\pi}}^C \, \rho_{\pi^C} + \hat{\bar{\eta}}^C \tag{144}$$

$$\hat{\pi}_H - \hat{\bar{\pi}}^C = \left(\hat{\pi}_H - \hat{\bar{\pi}}^C\right) \, \frac{\beta}{1+\beta\,\chi_H} + \left(\hat{\pi}_H - \hat{\bar{\pi}}^C\right) \, \frac{\chi_H}{1+\beta\,\chi_H} + \frac{(1-\beta\,\theta_H)\,(1-\theta_H)}{(1+\beta\,\chi_H)\,\theta_H} \, (\hat{mc} - \hat{p}_H) + \hat{\phi}^H \tag{145}$$

$$\hat{\pi}_X - \hat{\bar{\pi}}^C = \left(\hat{\pi}_X - \hat{\bar{\pi}}^C\right) \, \frac{\beta}{1+\beta\,\chi_X} + \left(\hat{\pi}_X - \hat{\bar{\pi}}^C\right) \, \frac{\chi_X}{1+\beta\,\chi_X} + \frac{(1-\beta\,\theta_X)\,(1-\theta_X)}{(1+\beta\,\chi_X)\,\theta_X} \, (\hat{mc} - \hat{p}_X) + \hat{\phi}^X \tag{146}$$

$$\begin{aligned} \hat{\pi}_{IM} - \hat{\bar{\pi}}^C = \left(\hat{\pi}_{IM} - \hat{\bar{\pi}}^C\right) \, \frac{\beta}{1+\beta\,\chi^M} + \left(\hat{\pi}_{IM} - \hat{\bar{\pi}}^C\right) \, \frac{\chi^M}{1+\beta\,\chi^M} \\ + \frac{(1-\beta\,\theta_M)\,(1-\theta_M)}{(1+\beta\,\chi^M)\,\theta_M} \, (\hat{s} + \hat{p}_Y - \hat{p}_{IM}) + \hat{\phi}^* \end{aligned} \tag{147}$$

$$\hat{c} = \bar{\nu}_C^{\frac{1}{\mu_C}} \, \left(\frac{\bar{h}^C}{\bar{q}^C}\right)^{1-\frac{1}{\mu_C}} \, (\hat{c} - \hat{p}_H\,\mu_C) + (1-\bar{\nu}_C)^{\frac{1}{\mu_C}} \, \left(\frac{\bar{i\bar{m}}^C}{\bar{q}^C}\right)^{1-\frac{1}{\mu_C}} \, \hat{i\bar{m}}^C \tag{148}$$

$$0 = \hat{p}_H\,\bar{\nu}_C\,\bar{p}_H^{1-\mu_C} + \hat{p}_{IM} \, (1-\bar{\nu}_C) \, \bar{p}_{IM}^{1-\mu_C} \tag{149}$$

$$\hat{i} = \bar{\nu}_I^{\frac{1}{\mu_I}} \, \left(\frac{\bar{h}^I}{\bar{q}^I}\right)^{1-\frac{1}{\mu_I}} \, \left(\hat{i} - \mu_I \, (\hat{p}_H - \hat{p}_I)\right) + (1-\bar{\nu}_I)^{\frac{1}{\mu_I}} \, \left(\frac{\bar{i\bar{m}}^I}{\bar{q}^I}\right)^{1-\frac{1}{\mu_I}} \, \hat{i\bar{m}}^I \tag{150}$$

$$\hat{p}_I = \hat{p}_H\,\bar{\nu}_I \, \left(\frac{\bar{p}_H}{\bar{p}_I}\right)^{1-\mu_I} + \hat{p}_{IM} \, (1-\bar{\nu}_I) \, \left(\frac{\bar{p}_{IM}}{\bar{p}_I}\right)^{1-\mu_I} \tag{151}$$

$$\hat{i\bar{m}} = \hat{i\bar{m}}^C \, \frac{\bar{i\bar{m}}^C}{\bar{i\bar{m}}} + \hat{i\bar{m}}^I \, \frac{\bar{i\bar{m}}^I}{\bar{i\bar{m}}} \tag{152}$$

$$\hat{x} = (-\mu^*) \, (\hat{p}_X - \hat{p}_Y - \hat{s}) + \hat{y}^* + ztilde \tag{153}$$

$$\hat{r} = \hat{r}\,\phi_R + (1-\phi_R) \, \left(\hat{\bar{\pi}}^C + \phi_\pi \, \left(\hat{\pi}_C - \hat{\bar{\pi}}^C\right)\right) + \hat{\eta}^R \tag{154}$$

$$\hat{y} = \frac{\bar{h}}{\bar{y}} \, \left((\hat{c} - \hat{p}_H\,\mu_C) \, \frac{\bar{h}^C}{\bar{h}} + \left(\hat{i} - \mu_I \, (\hat{p}_H - \hat{p}_I)\right) \, \frac{\bar{h}^I}{\bar{h}} + \frac{\bar{h}^G}{\bar{h}} \, \hat{g} + \frac{\bar{h}^{I_G}}{\bar{h}} \, \hat{i}_G\right) + \hat{x} \, \frac{\bar{x}}{\bar{y}} \tag{155}$$

$$\begin{aligned} \hat{y} + \hat{p}_Y = \hat{c} \, \frac{\bar{c}}{\bar{y}\,\bar{p}_Y} + \frac{\bar{p}_I\,\bar{i}}{\bar{y}\,\bar{p}_Y} \, \left(\hat{p}_I + \hat{i}\right) + \hat{u}\,\gamma_{u,1} \, \frac{\bar{p}_I\,\bar{k}}{\bar{y}\,\bar{g}\bar{z}\,\bar{p}_Y} + \frac{\bar{p}_G\,\bar{g}}{\bar{y}\,\bar{p}_Y} \, (\hat{p}_H + \hat{g}) + \frac{\bar{p}_{I_G}\,\bar{i_G}}{\bar{y}\,\bar{p}_Y} \, \left(\hat{p}_H + \hat{i}_G\right) \\ + \frac{\bar{x}\,\bar{p}_X}{\bar{y}\,\bar{p}_Y} \, (\hat{p}_X + \hat{x}) - \frac{\bar{i\bar{m}}^C\,\bar{p}_{IM}}{\bar{y}\,\bar{p}_Y} \, \left(\hat{p}_{IM} + \hat{i\bar{m}}^C\right) - \frac{\bar{p}_{IM}\,\bar{i\bar{m}}^I}{\bar{y}\,\bar{p}_Y} \, \left(\hat{p}_{IM} + \hat{i\bar{m}}^I\right) \end{aligned} \tag{156}$$

$$\hat{b}^* \left(-\left(\frac{1}{\bar{R}^*}\right)\right) + \hat{b}^* \frac{1}{\bar{gz}\,\bar{\pi}_Y^*} = \frac{\bar{x}\,\bar{p}_X}{\bar{s}\,\bar{p}_Y}\,(\hat{p}_X + \hat{x} - \hat{s} - \hat{p}_Y - ztilde) - \frac{\bar{p}_{IM}\,\bar{im}}{\bar{s}\,\bar{p}_Y}\left(\hat{p}_{IM} + \hat{im} - \hat{s} - \hat{p}_Y - ztilde\right) \tag{157}$$

$$\hat{p}_H = \hat{\pi}_H + \hat{p}_H - \hat{\pi}_C \tag{158}$$

$$\hat{p}_X = \hat{\pi}_X + \hat{p}_X - \hat{\pi}_C \tag{159}$$

$$\hat{p}_Y = \hat{\pi}_Y + \hat{p}_Y - \hat{\pi}_C \tag{160}$$

$$\hat{p}_I = \hat{p}_I + \hat{\pi}_I - \hat{\pi}_C \tag{161}$$

$$\hat{p}_{IM} = \hat{\pi}_{IM} + \hat{p}_{IM} - \hat{\pi}_C \tag{162}$$

$$\begin{aligned}\frac{\bar{p}_G\,\bar{g}}{\bar{y}\,\bar{p}_Y}\,(\hat{p}_H + \hat{g} - \hat{p}_Y - \hat{y}) = {} & \frac{\bar{c}}{\bar{y}\,\bar{p}_Y}\,(\hat{\tau}^c + \bar{\tau}^c\,(\hat{c} - \hat{p}_Y - \hat{y})) + \frac{\bar{w}\,\bar{N}}{\bar{y}\,\bar{p}_Y}\left(\hat{\tau}^w + \bar{\tau}^w\left(\hat{w} + \hat{N} - \hat{p}_Y - \hat{y}\right)\right) \\ & - \frac{\bar{p}_{I_G}\,\bar{i_G}}{\bar{y}\,\bar{p}_Y}\left(\hat{p}_H + \hat{i}_G - \hat{p}_Y - \hat{y}\right) \\ & + \frac{\bar{r}_K\,\bar{k}}{\bar{gz}\,\bar{y}\,\bar{p}_Y}\left(\hat{\tau}^k + \bar{\tau}^k\left(\hat{k} + \hat{r}_K + \hat{u} - \hat{g}_z - \hat{p}_Y - \hat{y}\right)\right) \\ & - \frac{\bar{p}_I\,\bar{k}}{\bar{gz}\,\bar{y}\,\bar{p}_Y}\left(\delta\,\hat{\tau}^k + \hat{u}\,\bar{\tau}^k\,\gamma_{u,1} + \delta\,\bar{\tau}^k\left(\hat{p}_I + \hat{k} - \hat{g}_z - \hat{p}_Y - \hat{y}\right)\right) \\ & + \frac{\bar{b}}{\bar{y}\,\bar{p}_Y\,Rgovbar}\left(\hat{b} - rrp - \hat{p}_Y - \hat{y}\right) \\ & - \frac{\bar{b}}{\bar{y}\,\bar{p}_Y\,\bar{gz}\,\bar{\pi}}\left(\hat{b} - \hat{\pi}_C - \hat{g}_z - \hat{p}_Y - \hat{y}\right) - \frac{\bar{tr}}{\bar{y}\,\bar{p}_Y}\left(\hat{tr} - \hat{p}_Y - \hat{y}\right)\end{aligned} \tag{163}$$

$$\hat{p}^{sus} - \hat{y} = \hat{b} + rrp - (\hat{\pi}_Y + dy) - \hat{y} \tag{164}$$

$$\hat{p}^{gap} = \hat{p}^{bud} - \hat{p}^{sus} \tag{165}$$

$$\hat{p}^{gapgdp} = \hat{p}^{bud} - \hat{p}^{sus} - \hat{y} \tag{166}$$

$$\begin{aligned}\hat{p}^{bud} = {} & \frac{\bar{c}}{\bar{y}\,\bar{p}_Y}\,(\hat{\tau}^c + \bar{\tau}^c\,(\hat{c} - \hat{p}_Y - \hat{y})) + \frac{\bar{w}\,\bar{N}}{\bar{y}\,\bar{p}_Y}\left(\hat{\tau}^w + \bar{\tau}^w\left(\hat{w} + \hat{N} - \hat{p}_Y - \hat{y}\right)\right) \\ & + \frac{\bar{r}_K\,\bar{k}}{\bar{gz}\,\bar{y}\,\bar{p}_Y}\left(\hat{\tau}^k + \bar{\tau}^k\left(\hat{k} + \hat{r}_K + \hat{u} - \hat{g}_z - \hat{p}_Y - \hat{y}\right)\right) \\ & - \frac{\bar{p}_G\,\bar{g}}{\bar{y}\,\bar{p}_Y}\,(\hat{p}_H + \hat{g} - \hat{p}_Y - \hat{y}) - \frac{\bar{p}_{I_G}\,\bar{i_G}}{\bar{y}\,\bar{p}_Y}\left(\hat{p}_H + \hat{i}_G - \hat{p}_Y - \hat{y}\right) \\ & - \frac{\bar{p}_I\,\bar{k}}{\bar{gz}\,\bar{y}\,\bar{p}_Y}\left(\delta\,\hat{\tau}^k + \hat{u}\,\bar{\tau}^k\,\gamma_{u,1} + \delta\,\bar{\tau}^k\left(\hat{p}_I + \hat{k} - \hat{g}_z - \hat{p}_Y - \hat{y}\right)\right) - \frac{\bar{tr}}{\bar{y}\,\bar{p}_Y}\left(\hat{tr} - \hat{p}_Y - \hat{y}\right)\end{aligned} \tag{167}$$

$$\hat{\bar{c}}^R = \hat{c}^R \, {\alpha_G}^{\frac{1}{\nu_G}} \, \left(\frac{\bar{c}^R}{\bar{\bar{c}}^R}\right)^{\frac{\nu_G - 1}{\nu_G}} + \hat{g} \, (1 - \alpha_G)^{\frac{1}{\nu_G}} \, \left(\frac{\bar{g}}{\bar{\bar{c}}^R}\right)^{\frac{\nu_G - 1}{\nu_G}} \tag{168}$$

$$\hat{\bar{k}} = \hat{k}^s \, {\alpha_K}^{\frac{1}{\nu_K}} \, \left(\frac{\bar{k}}{\bar{\bar{k}}}\right)^{\frac{\nu_K - 1}{\nu_K}} + \hat{k}_G \, (1 - \alpha_K)^{\frac{1}{\nu_K}} \, \left(\frac{\bar{k}_G}{\bar{\bar{k}}}\right)^{\frac{\nu_K - 1}{\nu_K}} \tag{169}$$

$$\hat{k}_G = \hat{k}_G \, \frac{1 - \delta_G}{\bar{g}z} - \hat{g}_z \, \frac{1 - \delta_G}{\bar{g}z} + \hat{i}_G \, \left(1 - \frac{1 - \delta_G}{\bar{g}z}\right) + \hat{\varepsilon}^i \, \gamma_I \, \bar{g}z^2 \, (1 + \beta) \, \left(1 - \frac{1 - \delta_G}{\bar{g}z}\right) \tag{170}$$

$$\hat{c} = \hat{c}^R \, \frac{\bar{c}^R \, (1 - \omega)}{\bar{c}} + \frac{\omega \, \bar{c}^{NR}}{\bar{c}} \, \hat{c}^{NR} \tag{171}$$

$$\hat{tr} = \frac{(1 - \omega) \, \bar{tr}^R}{\bar{tr}} \, \hat{tr}^R + \frac{\omega \, \bar{tr}^{NR}}{\bar{tr}} \, \hat{tr}^{NR} \tag{172}$$

$$\hat{tr}^R \, tr2rot = \hat{tr}^{NR} \, (1 - tr2rot) \tag{173}$$

$$0 = (1 + \bar{\tau}^c) \, \bar{c}^{NR} \, \left(\frac{\bar{\tau}^c}{1 + \bar{\tau}^c} \, \hat{\tau}^c + \hat{c}^{NR}\right) - \bar{N} \, (1 - \bar{\tau}^w) \, \bar{w} \, \left(\hat{w} + \hat{N} - \frac{1}{1 - \bar{\tau}^w} \, \hat{\tau}^w\right) - \bar{tr}^{NR} \, \hat{tr}^{NR} \tag{174}$$

$$\hat{\varepsilon}^C = \hat{\varepsilon}^C \, \rho_C + etaC \tag{175}$$

$$\hat{\varepsilon}^N = \hat{\varepsilon}^N \, \rho_N + \hat{\eta}^N \tag{176}$$

$$\hat{\varepsilon}^{RP} = \hat{\varepsilon}^{RP} \, \rho_{RP} + \hat{\eta}^{RP} \tag{177}$$

$$\hat{\varepsilon}^{RP^*} = \hat{\varepsilon}^{RP^*} \, \rho_{RP^*} + \hat{\eta}^{RP^*} \tag{178}$$

$$\hat{g}_z = \hat{g}_z \, \rho_{g_z} + \hat{\eta}^{g_z} \tag{179}$$

$$\hat{\varepsilon} = \hat{\varepsilon} \, \rho_\epsilon + \hat{\eta}^{\varepsilon} \tag{180}$$

$$\hat{\varepsilon}^i = \hat{\varepsilon}^i \, \rho_i + \hat{\eta}^i \tag{181}$$

$$\hat{\phi}^W = \hat{\phi}^W \, \rho_{\phi^W} + \hat{\eta}^{\phi^W} \tag{182}$$

$$\hat{\phi}^H = \hat{\phi}^H \, \rho_{\phi^H} + \hat{\eta}^{\phi^H} \tag{183}$$

$$\hat{\phi}^X = \hat{\phi}^X \, \rho_{\phi^X} + \hat{\eta}^{\phi^X} \tag{184}$$

$$\hat{\phi}^* = \hat{\phi}^* \, \rho_{\phi^*} + \hat{\eta}^{\phi^*} \tag{185}$$

$$\hat{g} = \hat{g} \, \rho_g - \hat{y} \, \theta_{GY} - \hat{b} \, \theta_{GB} + epsilonG \tag{186}$$

$$\hat{i}_G = \hat{i}_G \, \rho_{i_G} - \hat{y} \, \theta_{i_G Y} - \hat{b} \, \theta_{i_G B} + epsiloniG \tag{187}$$

$$\hat{tr} = \hat{tr} \, \rho_{tr} - \hat{y} \, \theta_{trY} - \hat{b} \, \theta_{trB} + epsilontr \tag{188}$$

$$\hat{\tau}^c = \hat{\tau}^c \, \rho_{\tau^c} + \hat{b} \, \theta_{\tau^c B} + \hat{y} \, \theta_{\tau^c Y} + epsilontauC \tag{189}$$

$$\hat{\tau}^w = \hat{\tau}^w \, \rho_{\tau^w} + \hat{b} \, \theta_{\tau^w B} + \hat{y} \, \theta_{\tau^w Y} + epsilontauN \tag{190}$$

$$\hat{\tau}^k = \hat{\tau}^k \, \rho_{\tau^k} + \hat{b} \, \theta_{\tau^k B} + \hat{y} \, \theta_{\tau^k Y} + epsilontauK \tag{191}$$

$$epsilonG = epsilonG \, rhoepsG + \hat{\eta}^g \tag{192}$$

$$epsiloniG = epsiloniG \, rhoepsiG + \hat{\eta}^{i_G} \tag{193}$$

$$epsilontr = epsilontr \, rhoepstr + \hat{\eta}^{tr} \tag{194}$$

$$epsilontauC = epsilontauC \, rhoepstauC + \hat{\eta}^{\tau^c} \tag{195}$$

$$epsilontauN = epsilontauN \, rhoepstauN + \hat{\eta}^{\tau^w} \tag{196}$$

$$epsilontauK = epsilontauK \, rhoepstauK + \hat{\eta}^{\tau^k} \tag{197}$$

$$\hat{\pi}^* = \hat{\pi}^* \, \frac{\chi^*}{1 + \chi^* \, \beta^*} + \hat{\pi}^* \, \frac{\beta^*}{1 + \chi^* \, \beta^*} + \frac{(1 - \theta_*) \, (1 - \beta^* \, \theta_*)}{(1 + \chi^* \, \beta^*) \, \theta_*} \, \left(\hat{y}^* \, (\sigma^* + \sigma_n^*) - (1 + \sigma_n^*) \, \hat{\varepsilon}^{Y^*} \right) \tag{198}$$

$$\hat{y}^* = \hat{y}^* \, \frac{1}{1 + \kappa^*} + \hat{y}^* \, \frac{\kappa^*}{1 + \kappa^*} - \frac{1 - \kappa^*}{\sigma^* \, (1 + \kappa^*)} \, \left(\hat{\varepsilon}^{RP^*} + \hat{r}^* - \hat{\pi}^* \right) \tag{199}$$

$$\hat{r}^* = \hat{r}^* \, \rho_{R^*} + (1 - \rho_{R^*}) \, \hat{\pi}^* \, kappapistar + epsilonrstar \tag{200}$$

$$\hat{\varepsilon}^{Y^*} = \hat{\varepsilon}^{Y^*} \, \rho_{Y^*} + \hat{\eta}^{y^*} \tag{201}$$

$$\hat{\varepsilon}^{\pi^*} = \hat{\varepsilon}^{\pi^*} \, \rho_{\pi^*} + \hat{\eta}^{\pi^*} \tag{202}$$

$$epsilonrstar = epsilonrstar \, rhoepsrstar + \hat{\eta}^{R^*} \tag{203}$$

$$\hat{N} + \hat{\varepsilon}^N = \hat{E} \tag{204}$$

$$\hat{\pi}^w = 0 \tag{205}$$

$$\frac{dy\_}{100} = \hat{g}_z + log\left(\bar{gz}\right) \tag{206}$$

$$\frac{dc\_}{100} = \hat{g}_z + log\left(\bar{gz} + 0.0014\right) + me\_c \tag{207}$$

$$\frac{dg\_}{100} = \hat{g}_z + log\left(\bar{gz} - 0.0006\right) \tag{208}$$

$$\frac{db\_}{100} = \hat{g}_z + log\left(\bar{gz} + 0.00529246\right) \tag{209}$$

$$\frac{gdebtgdp\_}{100} = \hat{b} - \hat{y} + 0.41131 + me\_b \tag{210}$$

$$\frac{dx\_}{100} = \hat{g}_z + log\left(\bar{gz} + 0.0002\right) \tag{211}$$

$$\frac{dim\_}{100} = \hat{g}_z + log\left(\bar{gz} + 0.0051\right) \tag{212}$$

$$\frac{dE\_}{100} = 0.001517847486464471 + me\_E \tag{213}$$

$$\frac{dw\_}{100} = \hat{g}_z + 0.004903259352432507 + me\_w \tag{214}$$

$$\frac{R\_}{100} = \hat{r} + log\left(\bar{R}\right) \tag{215}$$

$$\frac{di\_}{100} = \hat{g}_z + 0.01084270484626005 + me\_i \tag{216}$$

$$\frac{diG\_}{100} = \hat{g}_z + 0.0104254654835828 \tag{217}$$

$$\frac{dtr\_}{100} = \hat{g}_z + 0.01618924413810592 \tag{218}$$

$$\frac{pi\_im\_}{100} = \hat{\pi}_{IM} + log\left(\bar{\pi}\right) + me\_pi\_im \tag{219}$$

$$\frac{pi\_x\_}{100} = \hat{\pi}_{X} + log\left(\bar{\pi}\right) + me\_pi\_x \tag{220}$$

$$\frac{pi\_c\_}{100} = \hat{\pi}_{C} + log\left(\bar{\pi}\right) \tag{221}$$

$$\frac{pi\_cbar\_}{100} = \hat{\bar{\pi}}^{C} + log\left(\bar{\pi}\right) \tag{222}$$

$$\frac{pi\_h\_}{100} = \hat{\pi}_{H} + log\left(\bar{\pi}\right) \tag{223}$$

$$\frac{dtauC\_}{100} = 0.0001099939504436846 \tag{224}$$

$$\frac{dtauN\_}{100} = 0.000423010518433776 \tag{225}$$

$$\frac{dtauK\_}{100} = 0.0008113707497113416 \tag{226}$$

$$\frac{dy\_star\_}{100} = 0.007055054473677037 + me\_Ystar \tag{227}$$

$$\frac{R\_star\_}{100} = \hat{r}^{*} + log\left(\bar{R}^{*}\right) + me\_Rstar \tag{228}$$

$$\frac{pi\_Ystar\_}{100} = \hat{\pi}^{*} + log\left(\hat{\bar{\pi}}^{*}\right) + me\_piYstar \tag{229}$$

$$\frac{dsr\_}{100} = 0.002382808854793512 \tag{230}$$

$$dy = 0 \tag{231}$$

$$rrp = \hat{r} + \hat{\varepsilon}^{RP} + \left(\hat{b} - \hat{y}\right)\ \gamma_{B} \tag{232}$$

$$rrpstar = \hat{r}^{*} + \hat{\varepsilon}^{RP^{*}} + \frac{\gamma_{B^{*}}\ lamRPstar\ \bar{s}}{\bar{y}}\ \left(\hat{b}^{*} - \hat{y}\right) \tag{233}$$

$$\frac{b}{y} = \hat{b} - \hat{y} \tag{234}$$

$$\hat{\eta}^{y^*} = etaobsYstar \tag{235}$$

$$0 = etaobsPiYstar \tag{236}$$

$$\hat{\eta}^{R^*} = etaobsRstar \tag{237}$$

$$\hat{\eta}^{g} = etaobsg \tag{238}$$

$$\hat{\eta}^{i_G} = etaobsiG \tag{239}$$

$$\hat{\eta}^{tr} = etaobstr \tag{240}$$

$$\hat{\eta}^{R} = etaobsR \tag{241}$$

$$\hat{\eta}^{RP} = etaobsRPG \tag{242}$$

$$\hat{\eta}^{RP^*} = etaobsRPstar \tag{243}$$

$$\hat{\eta}^{g_z} = etaobsgz \tag{244}$$

$$\hat{\eta}^{\varepsilon} = etaobsepsilon \tag{245}$$

$$\hat{\eta}^{N} = etaobsN \tag{246}$$

$$etaC = etaobsC \tag{247}$$

$$\hat{\eta}^{i} = etaobsI \tag{248}$$

$$\hat{\eta}^{\phi^H} = etaobsvarphiH \tag{249}$$

$$\hat{\eta}^{\phi^X} = etaobsvarphiX \tag{250}$$

$$\hat{\eta}^{\phi^*} = etaobsvarphistar \tag{251}$$

$$\hat{\eta}^{\phi^W} = etaobsvarphiW \tag{252}$$

$$\hat{\eta}^{\tau^c} = etaobstauC \tag{253}$$

$$\hat{\eta}^{\tau^w} = etaobstauN \tag{254}$$

$$\hat{\eta}^{\tau^k} = etaobstauK \tag{255}$$

$$\hat{\bar{\eta}}^{C} = etaobspiCbar \tag{256}$$

$$me\_E = meobs\_E \tag{257}$$

$$me\_w = meobs\_w \tag{258}$$

$$me\_pi\_im = meobs\_pi\_im \tag{259}$$

$$me\_pi\_x = meobs\_pi\_x \tag{260}$$

$$me\_b = meobs\_b \tag{261}$$