

1. $-\sigma\tilde{C}_t + E\tilde{q}_{H',t+1} + E\tilde{\pi}_{t+1} = \tilde{q}_{H',t} - \sigma E\tilde{C}_{t+1} + \frac{\bar{r}^b}{1+\bar{r}^b}\tilde{r}_t^b$
2. $\sigma\tilde{C}_t + v\tilde{L}_t = \tilde{w}_{j,t} - \tilde{q}_{H',t} \quad J = H, H'$
3. $\tilde{r}_t^b - \sigma E\tilde{C}_{t+1} = -k\tilde{m}_t + E\tilde{q}_{H',t+1} + E\tilde{\pi}_{t+1}$
4. $\frac{\bar{r}^b}{1+\bar{r}^b}\tilde{r}_t^b + \tilde{q}_{H',t} = E\tilde{\pi}_{t+1} + \frac{\bar{\pi}(1-\delta)}{1+\bar{r}^b}E\tilde{q}_{H',t+1} + \left(1 - \frac{\bar{\pi}(1-\delta)}{1+\bar{r}^b}\right)E\tilde{r}_{j,t+1}^k \quad J = H, H'$
5. $\frac{\bar{r}^b}{1+\bar{r}^b}\tilde{r}_t^b + \tilde{q}_{H,t} = E\tilde{\pi}_{t+1} + \frac{\bar{\pi}(1-\delta'')}{1+\bar{r}^b}E\tilde{q}_{H,t+1} + \left(1 - \frac{\bar{\pi}(1-\delta'')}{1+\bar{r}^b}\right)E\tilde{r}_{t+1}^H =$
 $\frac{\bar{r}^b\bar{\pi}(1-\delta')}{1+\bar{r}^b-\bar{\pi}(1-\delta')} \frac{\tilde{r}_t^b}{1+\bar{r}^b} + E\tilde{H}_{t+1}^c + \frac{1+\bar{r}^b}{1+\bar{r}^b-\bar{\pi}(1-\delta')} \tilde{q}_{H,t} - \frac{\bar{r}^b\bar{\pi}(1-\delta')}{1+\bar{r}^b-\bar{\pi}(1-\delta')}E\tilde{\pi}_{t+1} -$
 $\frac{1+\bar{r}^b}{1+\bar{r}^b-\bar{\pi}(1-\delta')} \tilde{q}_{H,t+1} - \sigma\tilde{C}_t - \tilde{A}_t$
6. $\tilde{r}_t^b = \tilde{r}_t^d$
7. $\tilde{K}_{j,t+1} = (1-\delta)\tilde{K}_{j,t} + \delta\tilde{I}_{j,t} \quad J = H, H'$
8. $\tilde{H}_{t+1}^c = (1-\delta')\tilde{H}_t^c + \delta'\tilde{I}_{H^c,t}$
9. $H_{t+1}^{c'} = (1-\delta'')H_t^{c'} + \delta''\tilde{I}_{H^{c'},t}$
10. $\tilde{L}_t = \frac{\bar{L}_{H'}}{\bar{L}}\tilde{L}_{H',t} + \frac{\bar{L}_H}{\bar{L}}\tilde{L}_{H,t}$
11. $\tilde{P}_t = (1-\alpha)\left(\frac{\bar{P}_H}{\bar{P}}\right)^{1-\tau}\tilde{P}_{H,t} + \alpha\left(\frac{\bar{P}_{H'}}{\bar{P}}\right)^{1-\tau}\tilde{P}_{H',t}$
12. $\tilde{\pi}_t = \tilde{P}_t - \tilde{P}_{t-1}$
13. $\tilde{L}_t + \tilde{w}_{H,t} = \tilde{r}_{H,t}^k + \tilde{K}_{H,t}$
14. $\tilde{H}_t = \alpha_H\tilde{K}_{H,t} + \beta_H\tilde{L}_t$

$$15. \tilde{q}_{H,t} = \alpha_H \tilde{r}_{H,t}^k + \beta_H \tilde{w}_{H,t}$$

$$16. \tilde{q}_{H,t} = \tilde{p}_{H,t} - \tilde{p}_t$$

$$17. \tilde{\pi}_{H,t} = \tilde{p}_{H,t} - \tilde{p}_{H,t-1}$$

$$18. \tilde{A}_t = \rho_A \tilde{A}_{t-1} - \varepsilon_{A,t}$$

$$19. \tilde{L}_{H',t} + \tilde{w}_{H',t} = \tilde{r}_{H',t}^k + \tilde{K}_{H',t}$$

$$20. \tilde{r}_{H',t}^k + \tilde{K}_{H',t} = \tilde{r}_t^H + \tilde{H}_t^{c'}$$

$$21. \tilde{H}_t' = \alpha_{H'} \tilde{K}_{H',t} + \beta_{H'} \tilde{L}_{H',t} + \theta_{H'} \tilde{H}_t^{c'}$$

$$22. \tilde{q}_{H',t} = \rho(\tilde{q}_{H',t-1} - \tilde{\pi}_t) + (1 - \rho)\tilde{q}_{H',t}^*$$

$$23. \tilde{\pi}_{H',t} = \beta E_t \tilde{\pi}_{H',t} + \frac{(1-\rho)(1-\beta\rho)}{\rho} \tilde{m}c_{H',t}$$

$$24. \tilde{q}_{H',t} = \tilde{p}_{H',t} - \tilde{p}_t$$

$$25. \tilde{\pi}_{H',t} = \tilde{p}_{H',t} - \tilde{p}_{H',t-1}$$

$$26. \tilde{m}c_t - \alpha_{H'} \tilde{r}_{H',t} - \beta_{H'} \tilde{w}_{H',t} - \theta_{H'} \tilde{r}_t^H - \bar{\gamma}^{lo} =$$

$$\left(\frac{1}{1 - \bar{\gamma}^{lo} + \left(\beta(1 - \bar{\sigma})(1 + \bar{r}^{lo}) \left(\frac{\bar{r}^{lo}}{\bar{\pi}} \right) \right)} \right) \left(-\beta \left(\frac{\bar{r}^{lo}}{\bar{\pi}} \right) \bar{\sigma} (1 + \bar{r}^{lo}) E \tilde{\sigma}_{t+1} + \beta \left(\frac{\bar{\gamma}^{lo}}{\bar{\pi}} \right) \bar{r}^{lo} (1 + \right.$$

$$\left. \bar{\sigma} \right) \tilde{r}_t^{lo} - \tilde{\gamma}_t^{lo} - \left(\beta \frac{E \tilde{\pi}_{t+1}}{\bar{\pi}} \right)$$

$$27. \tilde{l}o_t^d = \tilde{\gamma}_t^{lo} + \bar{\gamma}^{lo} \left[(r_{H',t}^k + K_{H',t}) \left(\tilde{r}_{H',t}^k \frac{\bar{K}_{H'}}{\bar{l}o_t^d} \right) + (\tilde{w}_{H',t} + \tilde{L}_{H',t}) \left(\bar{w}_{H'} \frac{\bar{L}_{H'}}{\bar{l}o_t^d} \right) + \right.$$

$$\left. (\tilde{r}_t^H + \tilde{H}_t^{c'}) \left(\bar{r}^H \frac{\bar{H}^{c'}}{\bar{l}o_t^d} \right) \right]$$

$$28. \tilde{\gamma}_t^{lo} = \rho_\gamma \tilde{\gamma}_{t-1}^{lo} + \varepsilon_{\gamma,t}$$

$$29. \widetilde{TLO}_t = \frac{\bar{l}o^d}{\widetilde{TLO}} \widetilde{l}o_t^d - \frac{\bar{l}o_{H',t}}{\widetilde{TLO}} \widetilde{l}o_{H',t}$$

$$30. \widetilde{k}_{B,t} = (1 - \delta_{kB}) \widetilde{k}_{B,t-1} + \delta_{kB} \widetilde{\Pi}_{B,t} + (\widetilde{q}_{H,t} - \widetilde{q}_{H,t-1}) \frac{\bar{H}^b}{\bar{k}_B} \bar{q}_H$$

$$31. \frac{\bar{l}o_{H'}}{\bar{d}} \widetilde{l}o_{H',t} + \frac{\bar{l}o_g}{\bar{d}} \widetilde{l}o_{g,t} + \frac{\bar{H}^b}{\bar{d}} \bar{q}_H (\widetilde{q}_{H,t} - \widetilde{q}_{H,t-1}) + \bar{r}\bar{r}(\bar{d}_t + \bar{r}\bar{r}_t) = \frac{\bar{d}_c}{\bar{d}} \bar{d}_{c,t} + \bar{d}_t + \frac{\bar{k}_B}{\bar{d}} \widetilde{k}_{B,t+1}$$

$$32. \bar{r}_t^c = \bar{r}_t^{lo}$$

$$33. \bar{r}_t^c = \bar{r}_t^d - (\bar{r}\bar{r}_t \frac{\bar{r}\bar{r}}{\bar{r}\bar{r}-1})$$

$$34. (-E\bar{\sigma}_{t+1}\bar{\sigma}(1 + \bar{r}^{lo})) + (\bar{r}^{lo}\bar{r}_t^{lo}(1 - \bar{\sigma})) = \bar{r}^c \bar{r}_t^c$$

$$35. (1 + \bar{r}^c)\widetilde{q}_{H,t} + \bar{r}^c \bar{r}_t^c = \bar{\pi}(1 - \delta_{HB})(E\widetilde{q}_{H,t+1} + E\bar{\pi}_{t+1}) + (-1 + \beta(1 + \bar{r}^c))(E\widetilde{q}_{H,t+1} - \widetilde{q}_{H,t})$$

$$36. \bar{q}_{H'}(\widetilde{q}_{H,t'} + \bar{g}_t) + \left((1 + \bar{r}^b) \frac{\bar{b}}{\bar{\pi}\bar{g}} \right) (\bar{b}_{t-1} - \bar{\pi}_t) + \bar{r}^b \frac{\bar{b}}{\bar{\pi}\bar{g}} \bar{r}_{t-1}^b +$$

$$\left((1 + \bar{r}^{lo}) \frac{\bar{l}o_g}{\bar{\pi}\bar{g}} \right) (\widetilde{l}o_{g,t-1} - \bar{\pi}_t) + \bar{r}^{lo} \frac{\bar{l}o_g}{\bar{\pi}\bar{g}} \bar{r}_{t-1}^{lo} = \frac{\bar{b}}{\bar{g}} \bar{b}_t + \frac{\bar{t}}{\bar{g}} \bar{t}_t + \frac{\bar{l}o_g}{\bar{g}} \widetilde{l}o_{g,t} +$$

$$\frac{\bar{f}r}{\bar{g}} \bar{f}r_t + \frac{\bar{d}_g}{\bar{g}} \bar{d}_{g,t} - \frac{\bar{f}r}{\bar{\pi}\bar{g}} (\bar{f}r_{t-1} - \bar{\pi}_t) - \frac{\bar{d}_g}{\bar{\pi}\bar{g}} (\bar{d}_{g,t-1} - \bar{\pi}_t)$$

$$37. \bar{t}_t = \tau' \bar{y}_t$$

$$38. \widetilde{l}o_{g,t} = \rho_{lo} \widetilde{l}o_{g,t-1} + \varepsilon_{lo,t}$$

$$39. \bar{g}_t = \rho_{g_1} \bar{o}\bar{r}_t + \rho_{g_2} \bar{t}_t + \rho_{g_3} \bar{g}_{t-1} + \varepsilon_{g,t}$$

$$40. \bar{f}r_t = \rho_{fr} (\bar{f}r_{t-1} - \bar{\pi}_t) + \varphi_{fr} \frac{\bar{o}r}{\bar{f}r} \bar{o}r_t + \varepsilon_{fr,t}$$

$$41. \tilde{d}_{g,t} = \rho_{d_g} (\tilde{d}_{g,t-1} - \tilde{\pi}_t) + (1 - \varphi_{d_g}) \frac{\bar{or}}{\bar{d}_g} or_t + \varepsilon_{d_g,t}$$

$$42. \tilde{v}_t = \rho_v \tilde{v}_{t-1} + \varepsilon_{v,t}$$

$$43. \widetilde{or}_t = \rho_{or} \widetilde{or}_{t-1} + \varepsilon_{or,t}$$

$$44. \widetilde{rr}_t = \rho_{rr} \widetilde{rr}_{t-1} + \varepsilon_{rr,t}$$

$$45. \tilde{d}_{c,t} = \rho_{d_c} \tilde{d}_{c,t-1} + \varepsilon_{d_c,t}$$

$$46. \widetilde{mb}_t = \frac{\bar{d}_c}{\bar{mb}} \tilde{d}_{c,t} + \frac{\bar{fr}}{\bar{mb}} \widetilde{fr}_t + \frac{\bar{d}_g}{\bar{mb}} \tilde{d}_{g,t}$$

$$47. \widetilde{mb}_t = \tilde{m}_t + \bar{rr} \frac{\bar{d}}{\bar{mb}} (\widetilde{rr}_t + \tilde{d}_t)$$

$$48. \tilde{\eta}_t = \widetilde{mb}_t - \widetilde{mb}_{t-1} + \tilde{\pi}_t$$

$$49. \tilde{\eta}_t = \rho_{\eta} \tilde{\eta}_{t-1} + \lambda_{\pi} \tilde{\pi}_t + \lambda_{\pi} \tilde{y}_t + \tilde{v}_t$$

$$50. \tilde{Y}_t = \frac{\bar{q}_H \bar{H}}{\bar{Y}} (\tilde{q}_{H,t} + \tilde{H}_t) + \frac{\bar{q}_{H',t} \bar{H}'_t}{\bar{Y}} (\tilde{q}_{H',t} + \tilde{H}'_t)$$

$$51. \tilde{H}'_t = \frac{\bar{c}}{\bar{H}'} \tilde{C}_t + \frac{\bar{I}_H}{\bar{H}'} \tilde{L}_{H,t} + \frac{\bar{I}_{H'}}{\bar{H}'} \tilde{L}_{H',t} + \frac{\bar{g}}{\bar{H}'} \tilde{G}_t$$

$$52. \tilde{H}_t = \frac{\bar{I}_{H^c}}{\bar{H}} \tilde{I}_{H^c,t} + \frac{\bar{I}_{H^c'}}{\bar{H}} \tilde{I}_{H^c',t} + \frac{\bar{I}_{H^b}}{\bar{H}} \tilde{I}_{H^b,t}$$