

## Index sets

$$COUNTRY = \{F, H\}$$

## 1 CONSUMER $c \in COUNTRY$

### 1.1 Optimisation problem

$$\max_{K_t^{(c)}, C_t^{(c)}, H_t^{(c)}, I_t^{(c)}} U_t^{(c)} = \beta E_t \left[ U_{t+1}^{(c)} \right] + (1 - \eta)^{-1} \left( C_t^{(c)\mu} (1 - H_t^{(c)})^{1-\mu} \right)^{1-\eta} \quad (1.1)$$

s.t. :

$$C_t^{(c)} + I_t^{(c)} + T_t^{(c)} = \pi_t^{(c)} + TR_t^{(c)} + K_{t-1}^{(c)} r_t^{(c)} + H_t^{(c)} W_t^{(c)} - \psi^{(c)} K_{t-1}^{(c)} \left( -\delta^{(c)} + K_{t-1}^{(c)-1} I_t^{(c)} \right)^2 \quad \left( \lambda_t^{c(c)} \right) \quad (1.2)$$

$$K_t^{(c)} = I_t^{(c)} + K_{t-1}^{(c)} \left( 1 - \delta^{(c)} \right) \quad \left( \lambda^{\text{CONSUMER}^2(c)}_t \right) \quad (1.3)$$

### 1.2 First order conditions

$$-\lambda^{\text{CONSUMER}^2(c)}_t + \beta \left( \left( 1 - \delta^{(c)} \right) E_t \left[ \lambda^{\text{CONSUMER}^2(c)}_{t+1} \right] + E_t \left[ \lambda^{c(c)}_{t+1} \left( r_{t+1}^{(c)} - \psi^{(c)} \left( -\delta^{(c)} + K_t^{(c)-1} I_{t+1}^{(c)} \right)^2 + 2\psi^{(c)} K_t^{(c)-1} I_{t+1}^{(c)} \left( -\delta^{(c)} + K_t^{(c)-1} I_{t+1}^{(c)} \right) \right) \right] \right) = 0 \quad \left( K_t^{(c)} \right) \quad (1.4)$$

$$-\lambda^{c(c)}_t + \mu C_t^{(c)-1+\mu} \left( 1 - H_t^{(c)} \right)^{1-\mu} \left( C_t^{(c)\mu} \left( 1 - H_t^{(c)} \right)^{1-\mu} \right)^{-\eta} = 0 \quad \left( C_t^{(c)} \right) \quad (1.5)$$

$$\lambda^{c(c)}_t W_t^{(c)} + (-1 + \mu) C_t^{(c)\mu} \left( 1 - H_t^{(c)} \right)^{-\mu} \left( C_t^{(c)\mu} \left( 1 - H_t^{(c)} \right)^{1-\mu} \right)^{-\eta} = 0 \quad \left( H_t^{(c)} \right) \quad (1.6)$$

$$\lambda^{\text{CONSUMER}^2(c)}_t + \lambda^{c(c)}_t \left( -1 - 2\psi^{(c)} \left( -\delta^{(c)} + K_{t-1}^{(c)-1} I_t^{(c)} \right) \right) = 0 \quad \left( I_t^{(c)} \right) \quad (1.7)$$

## 2 FIRM $c \in COUNTRY$

### 2.1 Optimisation problem

$$\max_{K_t^{d(c)}, H_t^{d(c)}, Y_t^{(c)}, \pi_t^{(c)}} \Pi_t^{(c)} = \pi_t^{(c)} \quad (2.1)$$

s.t. :

$$Y_t^{(c)} = Z_t^{(c)} H_t^{d(c)1-\alpha^{(c)}} K_t^{d(c)\alpha^{(c)}} \left( \lambda^{\text{FIRM}^1(c)}_t \right) \quad (2.2)$$

$$\pi_t^{(c)} = Y_t^{(c)} - H_t^{d(c)} W_t^{(c)} - r_t^{(c)} K_t^{d(c)} \left( \lambda^{\text{FIRM}^2(c)}_t \right) \quad (2.3)$$

### 2.2 First order conditions

$$-\lambda^{\text{FIRM}^2(c)}_t r_t^{(c)} + \alpha^{(c)} \lambda^{\text{FIRM}^1(c)}_t Z_t^{(c)} H_t^{d(c)1-\alpha^{(c)}} K_t^{d(c)-1+\alpha^{(c)}} = 0 \quad \left( K_t^{d(c)} \right) \quad (2.4)$$

$$-\lambda^{\text{FIRM}^2(c)}_t W_t^{(c)} + \lambda^{\text{FIRM}^1(c)}_t Z_t^{(c)} \left( 1 - \alpha^{(c)} \right) H_t^{d(c)-\alpha^{(c)}} K_t^{d(c)\alpha^{(c)}} = 0 \quad \left( H_t^{d(c)} \right) \quad (2.5)$$

$$-\lambda^{\text{FIRM}^1(c)}_t + \lambda^{\text{FIRM}^2(c)}_t = 0 \quad \left( Y_t^{(c)} \right) \quad (2.6)$$

$$1 - \lambda^{\text{FIRM}^2(c)}_t = 0 \quad \left( \pi_t^{(c)} \right) \quad (2.7)$$

### 2.3 First order conditions after reduction

$$-r_t^{(c)} + \alpha^{(c)} Z_t^{(c)} H_t^{d(c)1-\alpha^{(c)}} K_t^{d(c)-1+\alpha^{(c)}} = 0 \quad \left( K_t^{d(c)} \right) \quad (2.8)$$

$$-W_t^{(c)} + Z_t^{(c)} \left( 1 - \alpha^{(c)} \right) H_t^{d(c)-\alpha^{(c)}} K_t^{d(c)\alpha^{(c)}} = 0 \quad \left( H_t^{d(c)} \right) \quad (2.9)$$

## 3 EQUILIBRIUM

### 3.1 Identities

$$\sum_{c \in COUNTRY} TR_t^{(c)} = 0 \quad (3.1)$$

$$c \in COUNTRY: \quad K_t^{d\langle c \rangle} = K_{t-1}^{d\langle c \rangle} \quad (3.2)$$

$$c \in COUNTRY: \quad H_t^{d\langle c \rangle} = H_t^{d\langle c \rangle} \quad (3.3)$$

$$c \in COUNTRY: \quad T_t^{d\langle c \rangle} = G_t^{d\langle c \rangle} \quad (3.4)$$

$$\lambda_t^{c\langle H \rangle} = \lambda_t^{c\langle F \rangle} \quad (3.5)$$

## 4 EXOG

### 4.1 Identities

$$c \in COUNTRY: \quad G_t^{d\langle c \rangle} = \epsilon_t^{G\langle c \rangle} + \phi^{G\langle c \rangle} G_{t-1}^{d\langle c \rangle} \quad (4.1)$$

$$c \in COUNTRY: \quad Z_t^{d\langle c \rangle} = e^{\epsilon_t^{Z\langle c \rangle} + \phi^{Z\langle c \rangle} \log Z_{t-1}^{d\langle c \rangle}} \quad (4.2)$$

## 5 Equilibrium relationships (before expansion and reduction)

$$-\lambda_t^{c\langle F \rangle} + \lambda_t^{c\langle H \rangle} = 0 \quad (5.1)$$

$$\sum_{c \in COUNTRY} TR_t^{d\langle c \rangle} = 0 \quad (5.2)$$

$$c \in COUNTRY: \quad -K_{t-1}^{d\langle c \rangle} + K_t^{d\langle c \rangle} = 0 \quad (5.3)$$

$$c \in COUNTRY: \quad -\lambda_t^{c\langle c \rangle} + \mu C_t^{c\langle c \rangle - 1 + \mu} \left(1 - H_t^{d\langle c \rangle}\right)^{1 - \mu} \left(C_t^{c\langle c \rangle} \left(1 - H_t^{d\langle c \rangle}\right)^{1 - \mu}\right)^{-\eta} = 0 \quad (5.4)$$

$$c \in COUNTRY: \quad -\lambda^{\text{CONSUMER}^2\langle c \rangle}_t + \beta \left( \left(1 - \delta^{d\langle c \rangle}\right) \text{E}_t \left[ \lambda^{\text{CONSUMER}^2\langle c \rangle}_{t+1} \right] + \text{E}_t \left[ \lambda^{c\langle c \rangle}_{t+1} \left( r_{t+1}^{d\langle c \rangle} - \psi^{d\langle c \rangle} \left( -\delta^{d\langle c \rangle} + K_t^{d\langle c \rangle - 1} I_{t+1}^{d\langle c \rangle} \right)^2 + 2\psi^{d\langle c \rangle} K_t^{d\langle c \rangle - 1} I_{t+1}^{d\langle c \rangle} \left( -\delta^{d\langle c \rangle} + K_t^{d\langle c \rangle - 1} I_{t+1}^{d\langle c \rangle} \right) \right] \right) \right) = 0 \quad (5.5)$$

$$c \in COUNTRY: \quad \lambda^{\text{CONSUMER}^2\langle c \rangle}_t + \lambda_t^{c\langle c \rangle} \left( -1 - 2\psi^{d\langle c \rangle} \left( -\delta^{d\langle c \rangle} + K_{t-1}^{d\langle c \rangle - 1} I_t^{d\langle c \rangle} \right) \right) = 0 \quad (5.6)$$

$$c \in COUNTRY: \quad -\pi_t^{d\langle c \rangle} + \Pi_t^{d\langle c \rangle} = 0 \quad (5.7)$$

$$c \in COUNTRY: \quad -r_t^{(c)} + \alpha^{(c)} Z_t^{(c)} H_t^{d(c)1-\alpha^{(c)}} K_t^{d(c)-1+\alpha^{(c)}} = 0 \quad (5.8)$$

$$c \in COUNTRY: \quad -G_t^{d(c)} + T_t^{(c)} = 0 \quad (5.9)$$

$$c \in COUNTRY: \quad -H_t^{(c)} + H_t^{d(c)} = 0 \quad (5.10)$$

$$c \in COUNTRY: \quad -W_t^{(c)} + Z_t^{(c)} \left(1 - \alpha^{(c)}\right) H_t^{d(c)-\alpha^{(c)}} K_t^{d(c)\alpha^{(c)}} = 0 \quad (5.11)$$

$$c \in COUNTRY: \quad -Y_t^{(c)} + Z_t^{(c)} H_t^{d(c)1-\alpha^{(c)}} K_t^{d(c)\alpha^{(c)}} = 0 \quad (5.12)$$

$$c \in COUNTRY: \quad Z_t^{(c)} - e^{\epsilon_t^{Z(c)} + \phi^{Z(c)} \log Z_{t-1}^{(c)}} = 0 \quad (5.13)$$

$$c \in COUNTRY: \quad \lambda_t^{c(c)} W_t^{(c)} + (-1 + \mu) C_t^{(c)\mu} \left(1 - H_t^{(c)}\right)^{-\mu} \left(C_t^{(c)\mu} \left(1 - H_t^{(c)}\right)^{1-\mu}\right)^{-\eta} = 0 \quad (5.14)$$

$$c \in COUNTRY: \quad -\epsilon_t^{G(c)} + G_t^{d(c)} - \phi^{G(c)} G_{t-1}^{d(c)} = 0 \quad (5.15)$$

$$c \in COUNTRY: \quad I_t^{(c)} - K_t^{(c)} + K_{t-1}^{(c)} \left(1 - \delta^{(c)}\right) = 0 \quad (5.16)$$

$$c \in COUNTRY: \quad U_t^{(c)} - \beta E_t \left[U_{t+1}^{(c)}\right] - (1 - \eta)^{-1} \left(C_t^{(c)\mu} \left(1 - H_t^{(c)}\right)^{1-\mu}\right)^{1-\eta} = 0 \quad (5.17)$$

$$c \in COUNTRY: \quad -\pi_t^{(c)} + Y_t^{(c)} - r_t^{(c)} K_t^{d(c)} - H_t^{d(c)} W_t^{(c)} = 0 \quad (5.18)$$

$$c \in COUNTRY: \quad \pi_t^{(c)} - C_t^{(c)} - I_t^{(c)} - T_t^{(c)} + TR_t^{(c)} + K_{t-1}^{(c)} r_t^{(c)} + H_t^{(c)} W_t^{(c)} - \psi^{(c)} K_{t-1}^{(c)} \left(-\delta^{(c)} + K_{t-1}^{(c)-1} I_t^{(c)}\right)^2 = 0 \quad (5.19)$$

## 6 Equilibrium relationships (after expansion and reduction)

$$-\lambda_t^{c\langle F \rangle} + \lambda_t^{c\langle H \rangle} = 0 \quad (6.1)$$

$$-\lambda_t^{c\langle F \rangle} + \mu C_t^{\langle F \rangle - 1 + \mu} \left(1 - H_t^{\langle F \rangle}\right)^{1 - \mu} \left(C_t^{\langle F \rangle \mu} \left(1 - H_t^{\langle F \rangle}\right)^{1 - \mu}\right)^{-\eta} = 0 \quad (6.2)$$

$$-\lambda_t^{c\langle H \rangle} + \mu C_t^{\langle H \rangle - 1 + \mu} \left(1 - H_t^{\langle H \rangle}\right)^{1 - \mu} \left(C_t^{\langle H \rangle \mu} \left(1 - H_t^{\langle H \rangle}\right)^{1 - \mu}\right)^{-\eta} = 0 \quad (6.3)$$

$$-r_t^{\langle F \rangle} + \alpha^{\langle F \rangle} Z_t^{\langle F \rangle} K_{t-1}^{\langle F \rangle - 1 + \alpha^{\langle F \rangle}} H_t^{\langle F \rangle 1 - \alpha^{\langle F \rangle}} = 0 \quad (6.4)$$

$$-r_t^{\langle H \rangle} + \alpha^{\langle H \rangle} Z_t^{\langle H \rangle} K_{t-1}^{\langle H \rangle - 1 + \alpha^{\langle H \rangle}} H_t^{\langle H \rangle 1 - \alpha^{\langle H \rangle}} = 0 \quad (6.5)$$

$$-W_t^{\langle F \rangle} + Z_t^{\langle F \rangle} \left(1 - \alpha^{\langle F \rangle}\right) K_{t-1}^{\langle F \rangle \alpha^{\langle F \rangle}} H_t^{\langle F \rangle - \alpha^{\langle F \rangle}} = 0 \quad (6.6)$$

$$-W_t^{\langle H \rangle} + Z_t^{\langle H \rangle} \left(1 - \alpha^{\langle H \rangle}\right) K_{t-1}^{\langle H \rangle \alpha^{\langle H \rangle}} H_t^{\langle H \rangle - \alpha^{\langle H \rangle}} = 0 \quad (6.7)$$

$$-Y_t^{\langle F \rangle} + Z_t^{\langle F \rangle} K_{t-1}^{\langle F \rangle \alpha^{\langle F \rangle}} H_t^{\langle F \rangle 1 - \alpha^{\langle F \rangle}} = 0 \quad (6.8)$$

$$-Y_t^{\langle H \rangle} + Z_t^{\langle H \rangle} K_{t-1}^{\langle H \rangle \alpha^{\langle H \rangle}} H_t^{\langle H \rangle 1 - \alpha^{\langle H \rangle}} = 0 \quad (6.9)$$

$$Z_t^{\langle F \rangle} - e^{\epsilon Z_t^{\langle F \rangle} + \phi Z^{\langle F \rangle} \log Z_{t-1}^{\langle F \rangle}} = 0 \quad (6.10)$$

$$Z_t^{\langle H \rangle} - e^{\epsilon Z_t^{\langle H \rangle} + \phi Z^{\langle H \rangle} \log Z_{t-1}^{\langle H \rangle}} = 0 \quad (6.11)$$

$$\beta \left( - \left(1 - \delta^{\langle F \rangle}\right) \mathbb{E}_t \left[ \lambda_{t+1}^{c\langle F \rangle} \left( -1 - 2\psi^{\langle F \rangle} \left( -\delta^{\langle F \rangle} + K_t^{\langle F \rangle - 1} I_{t+1}^{\langle F \rangle} \right) \right) \right] + \mathbb{E}_t \left[ \lambda_{t+1}^{c\langle F \rangle} \left( r_{t+1}^{\langle F \rangle} - \psi^{\langle F \rangle} \left( -\delta^{\langle F \rangle} + K_t^{\langle F \rangle - 1} I_{t+1}^{\langle F \rangle} \right)^2 + 2\psi^{\langle F \rangle} K_t^{\langle F \rangle - 1} I_{t+1}^{\langle F \rangle} \left( -\delta^{\langle F \rangle} + K_t^{\langle F \rangle - 1} I_{t+1}^{\langle F \rangle} \right) \right) \right] \right) + \lambda_t^{c\langle F \rangle} \left( -1 - 2\psi^{\langle F \rangle} \left( -\delta^{\langle F \rangle} + K_t^{\langle F \rangle - 1} I_{t+1}^{\langle F \rangle} \right) \right) \quad (6.12)$$

$$\beta \left( - \left(1 - \delta^{\langle H \rangle}\right) \mathbb{E}_t \left[ \lambda_{t+1}^{c\langle H \rangle} \left( -1 - 2\psi^{\langle H \rangle} \left( -\delta^{\langle H \rangle} + K_t^{\langle H \rangle - 1} I_{t+1}^{\langle H \rangle} \right) \right) \right] + \mathbb{E}_t \left[ \lambda_{t+1}^{c\langle H \rangle} \left( r_{t+1}^{\langle H \rangle} - \psi^{\langle H \rangle} \left( -\delta^{\langle H \rangle} + K_t^{\langle H \rangle - 1} I_{t+1}^{\langle H \rangle} \right)^2 + 2\psi^{\langle H \rangle} K_t^{\langle H \rangle - 1} I_{t+1}^{\langle H \rangle} \left( -\delta^{\langle H \rangle} + K_t^{\langle H \rangle - 1} I_{t+1}^{\langle H \rangle} \right) \right) \right] \right) + \lambda_t^{c\langle H \rangle} \left( -1 - 2\psi^{\langle H \rangle} \left( -\delta^{\langle H \rangle} + K_t^{\langle H \rangle - 1} I_{t+1}^{\langle H \rangle} \right) \right) \quad (6.13)$$

$$\lambda_t^{c\langle F \rangle} W_t^{\langle F \rangle} + (-1 + \mu) C_t^{\langle F \rangle \mu} \left(1 - H_t^{\langle F \rangle}\right)^{-\mu} \left(C_t^{\langle F \rangle \mu} \left(1 - H_t^{\langle F \rangle}\right)^{1-\mu}\right)^{-\eta} = 0 \quad (6.14)$$

$$\lambda_t^{c\langle H \rangle} W_t^{\langle H \rangle} + (-1 + \mu) C_t^{\langle H \rangle \mu} \left(1 - H_t^{\langle H \rangle}\right)^{-\mu} \left(C_t^{\langle H \rangle \mu} \left(1 - H_t^{\langle H \rangle}\right)^{1-\mu}\right)^{-\eta} = 0 \quad (6.15)$$

$$-\epsilon_t^{G\langle F \rangle} + G_t^{d\langle F \rangle} - \phi^{G\langle F \rangle} G_{t-1}^{d\langle F \rangle} = 0 \quad (6.16)$$

$$-\epsilon_t^{G\langle H \rangle} + G_t^{d\langle H \rangle} - \phi^{G\langle H \rangle} G_{t-1}^{d\langle H \rangle} = 0 \quad (6.17)$$

$$I_t^{\langle F \rangle} - K_t^{\langle F \rangle} + K_{t-1}^{\langle F \rangle} \left(1 - \delta^{\langle F \rangle}\right) = 0 \quad (6.18)$$

$$I_t^{\langle H \rangle} - K_t^{\langle H \rangle} + K_{t-1}^{\langle H \rangle} \left(1 - \delta^{\langle H \rangle}\right) = 0 \quad (6.19)$$

$$U_t^{\langle F \rangle} - \beta E_t \left[ U_{t+1}^{\langle F \rangle} \right] - (1 - \eta)^{-1} \left( C_t^{\langle F \rangle \mu} \left(1 - H_t^{\langle F \rangle}\right)^{1-\mu} \right)^{1-\eta} = 0 \quad (6.20)$$

$$U_t^{\langle H \rangle} - \beta E_t \left[ U_{t+1}^{\langle H \rangle} \right] - (1 - \eta)^{-1} \left( C_t^{\langle H \rangle \mu} \left(1 - H_t^{\langle H \rangle}\right)^{1-\mu} \right)^{1-\eta} = 0 \quad (6.21)$$

$$-C_t^{\langle F \rangle} - G_t^{d\langle F \rangle} - I_t^{\langle F \rangle} - TR_t^{\langle H \rangle} + Y_t^{\langle F \rangle} - \psi^{\langle F \rangle} K_{t-1}^{\langle F \rangle} \left( -\delta^{\langle F \rangle} + K_{t-1}^{\langle F \rangle -1} I_t^{\langle F \rangle} \right)^2 = 0 \quad (6.22)$$

$$-C_t^{\langle H \rangle} - G_t^{d\langle H \rangle} - I_t^{\langle H \rangle} + TR_t^{\langle H \rangle} + Y_t^{\langle H \rangle} - \psi^{\langle H \rangle} K_{t-1}^{\langle H \rangle} \left( -\delta^{\langle H \rangle} + K_{t-1}^{\langle H \rangle -1} I_t^{\langle H \rangle} \right)^2 = 0 \quad (6.23)$$

## 7 Steady state relationships (before expansion and reduction)

$$-\lambda_{ss}^{c\langle F \rangle} + \lambda_{ss}^{c\langle H \rangle} = 0 \quad (7.1)$$

$$\sum_{c \in COUNTRY} TR_{ss}^{\langle c \rangle} = 0 \quad (7.2)$$

$$c \in COUNTRY: \quad -K_{ss}^{\langle c \rangle} + K_{ss}^{d\langle c \rangle} = 0 \quad (7.3)$$

$$c \in COUNTRY: \quad -\lambda_{ss}^{c\langle c \rangle} + \mu C_{ss}^{\langle c \rangle -1+\mu} \left(1 - H_{ss}^{\langle c \rangle}\right)^{1-\mu} \left(C_{ss}^{\langle c \rangle \mu} \left(1 - H_{ss}^{\langle c \rangle}\right)^{1-\mu}\right)^{-\eta} = 0 \quad (7.4)$$

$$c \in COUNTRY: \quad -\lambda^{\text{CONSUMER}^2 \langle c \rangle}_{ss} + \beta \left( \lambda_{ss}^{c \langle c \rangle} \left( r_{ss}^{c \langle c \rangle} - \psi^{c \langle c \rangle} \left( -\delta^{c \langle c \rangle} + I_{ss}^{c \langle c \rangle} K_{ss}^{c \langle c \rangle} \right)^{-1} \right)^2 + 2\psi^{c \langle c \rangle} I_{ss}^{c \langle c \rangle} K_{ss}^{c \langle c \rangle} \left( -\delta^{c \langle c \rangle} + I_{ss}^{c \langle c \rangle} K_{ss}^{c \langle c \rangle} \right)^{-1} \right) + \lambda^{\text{CONSUMER}^2 \langle c \rangle}_{ss} \left( 1 - \delta^{c \langle c \rangle} \right) = 0 \quad (7.5)$$

$$c \in COUNTRY: \quad \lambda^{\text{CONSUMER}^2 \langle c \rangle}_{ss} + \lambda_{ss}^{c \langle c \rangle} \left( -1 - 2\psi^{c \langle c \rangle} \left( -\delta^{c \langle c \rangle} + I_{ss}^{c \langle c \rangle} K_{ss}^{c \langle c \rangle} \right)^{-1} \right) = 0 \quad (7.6)$$

$$c \in COUNTRY: \quad -\pi_{ss}^{c \langle c \rangle} + \Pi_{ss}^{c \langle c \rangle} = 0 \quad (7.7)$$

$$c \in COUNTRY: \quad -r_{ss}^{c \langle c \rangle} + \alpha^{c \langle c \rangle} Z_{ss}^{c \langle c \rangle} H_{ss}^{d \langle c \rangle} {}^{1-\alpha^{c \langle c \rangle}} K_{ss}^{d \langle c \rangle} {}^{-1+\alpha^{c \langle c \rangle}} = 0 \quad (7.8)$$

$$c \in COUNTRY: \quad -G_{ss}^{d \langle c \rangle} + T_{ss}^{c \langle c \rangle} = 0 \quad (7.9)$$

$$c \in COUNTRY: \quad -H_{ss}^{c \langle c \rangle} + H_{ss}^{d \langle c \rangle} = 0 \quad (7.10)$$

$$c \in COUNTRY: \quad -W_{ss}^{c \langle c \rangle} + Z_{ss}^{c \langle c \rangle} \left( 1 - \alpha^{c \langle c \rangle} \right) H_{ss}^{d \langle c \rangle} {}^{-\alpha^{c \langle c \rangle}} K_{ss}^{d \langle c \rangle} {}^{\alpha^{c \langle c \rangle}} = 0 \quad (7.11)$$

$$c \in COUNTRY: \quad -Y_{ss}^{c \langle c \rangle} + Z_{ss}^{c \langle c \rangle} H_{ss}^{d \langle c \rangle} {}^{1-\alpha^{c \langle c \rangle}} K_{ss}^{d \langle c \rangle} {}^{\alpha^{c \langle c \rangle}} = 0 \quad (7.12)$$

$$c \in COUNTRY: \quad Z_{ss}^{c \langle c \rangle} - e^{\epsilon_{ss}^{Z \langle c \rangle} + \phi^{Z \langle c \rangle} \log Z_{ss}^{c \langle c \rangle}} = 0 \quad (7.13)$$

$$c \in COUNTRY: \quad \lambda_{ss}^{c \langle c \rangle} W_{ss}^{c \langle c \rangle} + (-1 + \mu) C_{ss}^{c \langle c \rangle} {}^{\mu} \left( 1 - H_{ss}^{c \langle c \rangle} \right) {}^{-\mu} \left( C_{ss}^{c \langle c \rangle} {}^{\mu} \left( 1 - H_{ss}^{c \langle c \rangle} \right) {}^{1-\mu} \right) {}^{-\eta} = 0 \quad (7.14)$$

$$c \in COUNTRY: \quad -\epsilon_{ss}^{G \langle c \rangle} + G_{ss}^{d \langle c \rangle} - \phi^{G \langle c \rangle} G_{ss}^{d \langle c \rangle} = 0 \quad (7.15)$$

$$c \in COUNTRY: \quad I_{ss}^{c \langle c \rangle} - K_{ss}^{c \langle c \rangle} + K_{ss}^{c \langle c \rangle} \left( 1 - \delta^{c \langle c \rangle} \right) = 0 \quad (7.16)$$

$$c \in COUNTRY: \quad U_{ss}^{c \langle c \rangle} - \beta U_{ss}^{c \langle c \rangle} - (1 - \eta)^{-1} \left( \left( 1 - H_{ss}^{c \langle c \rangle} \right) {}^{1-\mu} C_{ss}^{c \langle c \rangle} {}^{\mu} \right) {}^{1-\eta} = 0 \quad (7.17)$$

$$c \in COUNTRY: \quad -\pi_{ss}^{c \langle c \rangle} + Y_{ss}^{c \langle c \rangle} - r_{ss}^{c \langle c \rangle} K_{ss}^{d \langle c \rangle} - H_{ss}^{d \langle c \rangle} W_{ss}^{c \langle c \rangle} = 0 \quad (7.18)$$

$$c \in COUNTRY: \quad \pi_{ss}^{c \langle c \rangle} - C_{ss}^{c \langle c \rangle} - I_{ss}^{c \langle c \rangle} - T_{ss}^{c \langle c \rangle} + TR_{ss}^{c \langle c \rangle} + r_{ss}^{c \langle c \rangle} K_{ss}^{c \langle c \rangle} + H_{ss}^{c \langle c \rangle} W_{ss}^{c \langle c \rangle} - \psi^{c \langle c \rangle} K_{ss}^{c \langle c \rangle} \left( -\delta^{c \langle c \rangle} + I_{ss}^{c \langle c \rangle} K_{ss}^{c \langle c \rangle} \right)^{-1} {}^2 = 0 \quad (7.19)$$

## 8 Steady state relationships (after expansion and reduction)

$$-\lambda_{ss}^{c\langle F \rangle} + \lambda_{ss}^{c\langle H \rangle} = 0 \quad (8.1)$$

$$-\lambda_{ss}^{c\langle F \rangle} + \mu C_{ss}^{\langle F \rangle -1+\mu} \left(1 - H_{ss}^{\langle F \rangle}\right)^{1-\mu} \left(C_{ss}^{\langle F \rangle \mu} \left(1 - H_{ss}^{\langle F \rangle}\right)^{1-\mu}\right)^{-\eta} = 0 \quad (8.2)$$

$$-\lambda_{ss}^{c\langle H \rangle} + \mu C_{ss}^{\langle H \rangle -1+\mu} \left(1 - H_{ss}^{\langle H \rangle}\right)^{1-\mu} \left(C_{ss}^{\langle H \rangle \mu} \left(1 - H_{ss}^{\langle H \rangle}\right)^{1-\mu}\right)^{-\eta} = 0 \quad (8.3)$$

$$-r_{ss}^{\langle F \rangle} + \alpha^{\langle F \rangle} Z_{ss}^{\langle F \rangle} H_{ss}^{\langle F \rangle 1-\alpha^{\langle F \rangle}} K_{ss}^{\langle F \rangle -1+\alpha^{\langle F \rangle}} = 0 \quad (8.4)$$

$$-r_{ss}^{\langle H \rangle} + \alpha^{\langle H \rangle} Z_{ss}^{\langle H \rangle} H_{ss}^{\langle H \rangle 1-\alpha^{\langle H \rangle}} K_{ss}^{\langle H \rangle -1+\alpha^{\langle H \rangle}} = 0 \quad (8.5)$$

$$-W_{ss}^{\langle F \rangle} + Z_{ss}^{\langle F \rangle} \left(1 - \alpha^{\langle F \rangle}\right) H_{ss}^{\langle F \rangle -\alpha^{\langle F \rangle}} K_{ss}^{\langle F \rangle \alpha^{\langle F \rangle}} = 0 \quad (8.6)$$

$$-W_{ss}^{\langle H \rangle} + Z_{ss}^{\langle H \rangle} \left(1 - \alpha^{\langle H \rangle}\right) H_{ss}^{\langle H \rangle -\alpha^{\langle H \rangle}} K_{ss}^{\langle H \rangle \alpha^{\langle H \rangle}} = 0 \quad (8.7)$$

$$-Y_{ss}^{\langle F \rangle} + Z_{ss}^{\langle F \rangle} H_{ss}^{\langle F \rangle 1-\alpha^{\langle F \rangle}} K_{ss}^{\langle F \rangle \alpha^{\langle F \rangle}} = 0 \quad (8.8)$$

$$-Y_{ss}^{\langle H \rangle} + Z_{ss}^{\langle H \rangle} H_{ss}^{\langle H \rangle 1-\alpha^{\langle H \rangle}} K_{ss}^{\langle H \rangle \alpha^{\langle H \rangle}} = 0 \quad (8.9)$$

$$Z_{ss}^{\langle F \rangle} - e^{\phi^{Z\langle F \rangle} \log Z_{ss}^{\langle F \rangle}} = 0 \quad (8.10)$$

$$Z_{ss}^{\langle H \rangle} - e^{\phi^{Z\langle H \rangle} \log Z_{ss}^{\langle H \rangle}} = 0 \quad (8.11)$$

$$\beta \left( \lambda_{ss}^{c\langle F \rangle} \left( r_{ss}^{\langle F \rangle} - \psi^{\langle F \rangle} \left( -\delta^{\langle F \rangle} + I_{ss}^{\langle F \rangle} K_{ss}^{\langle F \rangle -1} \right)^2 + 2\psi^{\langle F \rangle} I_{ss}^{\langle F \rangle} K_{ss}^{\langle F \rangle -1} \left( -\delta^{\langle F \rangle} + I_{ss}^{\langle F \rangle} K_{ss}^{\langle F \rangle -1} \right) \right) - \lambda_{ss}^{c\langle F \rangle} \left( -1 - 2\psi^{\langle F \rangle} \left( -\delta^{\langle F \rangle} + I_{ss}^{\langle F \rangle} K_{ss}^{\langle F \rangle -1} \right) \right) \left( 1 - \delta^{\langle F \rangle} \right) \right) + \lambda_{ss}^{c\langle F \rangle} \left( -1 - 2\psi^{\langle F \rangle} \left( -\delta^{\langle F \rangle} + I_{ss}^{\langle F \rangle} K_{ss}^{\langle F \rangle -1} \right) \right) \quad (8.12)$$

$$\beta \left( \lambda_{ss}^{c\langle H \rangle} \left( r_{ss}^{\langle H \rangle} - \psi^{\langle H \rangle} \left( -\delta^{\langle H \rangle} + I_{ss}^{\langle H \rangle} K_{ss}^{\langle H \rangle -1} \right)^2 + 2\psi^{\langle H \rangle} I_{ss}^{\langle H \rangle} K_{ss}^{\langle H \rangle -1} \left( -\delta^{\langle H \rangle} + I_{ss}^{\langle H \rangle} K_{ss}^{\langle H \rangle -1} \right) \right) - \lambda_{ss}^{c\langle H \rangle} \left( -1 - 2\psi^{\langle H \rangle} \left( -\delta^{\langle H \rangle} + I_{ss}^{\langle H \rangle} K_{ss}^{\langle H \rangle -1} \right) \right) \left( 1 - \delta^{\langle H \rangle} \right) \right) + \lambda_{ss}^{c\langle H \rangle} \left( -1 - 2\psi^{\langle H \rangle} \left( -\delta^{\langle H \rangle} + I_{ss}^{\langle H \rangle} K_{ss}^{\langle H \rangle -1} \right) \right) \quad (8.13)$$



$$\lambda_{ss}^{c\langle F \rangle} W_{ss}^{\langle F \rangle} + (-1 + \mu) C_{ss}^{\langle F \rangle \mu} \left(1 - H_{ss}^{\langle F \rangle}\right)^{-\mu} \left(C_{ss}^{\langle F \rangle \mu} \left(1 - H_{ss}^{\langle F \rangle}\right)^{1-\mu}\right)^{-\eta} = 0 \quad (8.14)$$

$$\lambda_{ss}^{c\langle H \rangle} W_{ss}^{\langle H \rangle} + (-1 + \mu) C_{ss}^{\langle H \rangle \mu} \left(1 - H_{ss}^{\langle H \rangle}\right)^{-\mu} \left(\left(1 - H_{ss}^{\langle H \rangle}\right)^{1-\mu} C_{ss}^{\langle H \rangle \mu}\right)^{-\eta} = 0 \quad (8.15)$$

$$G_{ss}^{d\langle F \rangle} - \phi^{G\langle F \rangle} G_{ss}^{d\langle F \rangle} = 0 \quad (8.16)$$

$$G_{ss}^{d\langle H \rangle} - \phi^{G\langle H \rangle} G_{ss}^{d\langle H \rangle} = 0 \quad (8.17)$$

$$I_{ss}^{\langle F \rangle} - K_{ss}^{\langle F \rangle} + K_{ss}^{\langle F \rangle} \left(1 - \delta^{\langle F \rangle}\right) = 0 \quad (8.18)$$

$$I_{ss}^{\langle H \rangle} - K_{ss}^{\langle H \rangle} + K_{ss}^{\langle H \rangle} \left(1 - \delta^{\langle H \rangle}\right) = 0 \quad (8.19)$$

$$U_{ss}^{\langle F \rangle} - \beta U_{ss}^{\langle F \rangle} - (1 - \eta)^{-1} \left(C_{ss}^{\langle F \rangle \mu} \left(1 - H_{ss}^{\langle F \rangle}\right)^{1-\mu}\right)^{1-\eta} = 0 \quad (8.20)$$

$$U_{ss}^{\langle H \rangle} - \beta U_{ss}^{\langle H \rangle} - (1 - \eta)^{-1} \left(C_{ss}^{\langle H \rangle \mu} \left(1 - H_{ss}^{\langle H \rangle}\right)^{1-\mu}\right)^{1-\eta} = 0 \quad (8.21)$$

$$-C_{ss}^{\langle F \rangle} - G_{ss}^{d\langle F \rangle} - I_{ss}^{\langle F \rangle} - TR_{ss}^{\langle H \rangle} + Y_{ss}^{\langle F \rangle} - \psi^{\langle F \rangle} K_{ss}^{\langle F \rangle} \left(-\delta^{\langle F \rangle} + I_{ss}^{\langle F \rangle} K_{ss}^{\langle F \rangle -1}\right)^2 = 0 \quad (8.22)$$

$$-C_{ss}^{\langle H \rangle} - G_{ss}^{d\langle H \rangle} - I_{ss}^{\langle H \rangle} + TR_{ss}^{\langle H \rangle} + Y_{ss}^{\langle H \rangle} - \psi^{\langle H \rangle} K_{ss}^{\langle H \rangle} \left(-\delta^{\langle H \rangle} + I_{ss}^{\langle H \rangle} K_{ss}^{\langle H \rangle -1}\right)^2 = 0 \quad (8.23)$$

## 9 Steady-state values

	Steady-state values
$\lambda^{c^F}$	0.3934
$\lambda^{c^H}$	0.3934
$r^F$	0.0351
$r^H$	0.0351
$C^F$	0.9578
$C^H$	0.9578
$G^{d^F}$	0
$G^{d^H}$	0
$H^F$	0.2645
$H^H$	0.2645
$I^F$	0.3816
$I^H$	0.3816
$K^F$	15.2627
$K^H$	15.2627
$TR^H$	0
$U^F$	-125.6048
$U^H$	-125.6048
$W^F$	3.0384
$W^H$	3.0384
$Y^F$	1.3393
$Y^H$	1.3393
$Z^F$	1
$Z^H$	1

## 10 The solution of the perturbation

### 10.1 P

$$\begin{matrix} G^{d^F} \\ G^{d^H} \\ K^F \\ K^H \\ Z^F \\ Z^H \end{matrix} \begin{pmatrix} G_{t-1}^{d^F} & G_{t-1}^{d^H} & K_{t-1}^F & K_{t-1}^H & Z_{t-1}^F & Z_{t-1}^H \\ 0.95 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0.95 & 0 & 0 & 0 & 0 \\ -0.1542 & -0.1542 & 0.9454 & 0.0244 & 2.2856 & -1.0704 \\ -0.1542 & -0.1542 & 0.0244 & 0.9454 & -1.0704 & 2.2856 \\ 0 & 0 & 0 & 0 & 0.95 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0.95 \end{pmatrix}$$

### 10.2 Q

$$\begin{matrix} G^{d^F} \\ G^{d^H} \\ K^F \\ K^H \\ Z^F \\ Z^H \end{matrix} \begin{pmatrix} \epsilon^{Z^F} & \epsilon^{Z^H} & \epsilon^{G^F} & \epsilon^{G^H} \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 2.4059 & -1.1267 & -0.1623 & -0.1623 \\ -1.1267 & 2.4059 & -0.1623 & -0.1623 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$$

### 10.3 R

$$\begin{matrix}
\lambda^{c^F} \\
\lambda^{c^H} \\
r^F \\
r^H \\
C^F \\
C^H \\
H^F \\
H^H \\
I^F \\
I^H \\
TR^H \\
U^F \\
U^H \\
W^F \\
W^H \\
Y^F \\
Y^H
\end{matrix}
\begin{pmatrix}
G_{t-1}^{d^F} & G_{t-1}^{d^H} & K_{t-1}^F & K_{t-1}^H & Z_{t-1}^F & Z_{t-1}^H \\
0.1022 & 0.1022 & -0.0091 & -0.0091 & -0.1072 & -0.1072 \\
0.1022 & 0.1022 & -0.0091 & -0.0091 & -0.1072 & -0.1072 \\
0.0044 & 0.0044 & -0.0012 & -0.0004 & 0.0497 & -0.0046 \\
0.0044 & 0.0044 & -0.0004 & -0.0012 & -0.0046 & 0.0497 \\
-0.1525 & -0.1525 & 0.0187 & 0.0136 & 0.3448 & 0.1599 \\
-0.1525 & -0.1525 & 0.0136 & 0.0187 & 0.1599 & 0.3448 \\
0.0554 & 0.0554 & 0.0023 & -0.0049 & 0.2054 & -0.0581 \\
0.0554 & 0.0554 & -0.0049 & 0.0023 & -0.0581 & 0.2054 \\
-0.1542 & -0.1542 & -0.0296 & 0.0244 & 2.2856 & -1.0704 \\
-0.1542 & -0.1542 & 0.0244 & -0.0296 & -1.0704 & 2.2856 \\
-0.475 & 0.475 & 0.053 & -0.053 & -0.7338 & 0.7338 \\
-3.1408 & -3.1408 & 0.1608 & 0.2366 & 0.053 & 8.3603 \\
-3.1408 & -3.1408 & 0.2366 & 0.1608 & 8.3603 & 0.053 \\
-0.2547 & -0.2547 & 0.0689 & 0.0227 & 1.9424 & 0.2672 \\
-0.2547 & -0.2547 & 0.0227 & 0.0689 & 0.2672 & 1.9424 \\
0.1684 & 0.1684 & 0.0422 & -0.015 & 1.8966 & -0.1767 \\
0.1684 & 0.1684 & -0.015 & 0.0422 & -0.1767 & 1.8966
\end{pmatrix}$$

### 10.4 S

$$\begin{matrix}
\lambda^{c^F} \\
\lambda^{c^H} \\
r^F \\
r^H \\
C^F \\
C^H \\
H^F \\
H^H \\
I^F \\
I^H \\
TR^H \\
U^F \\
U^H \\
W^F \\
W^H \\
Y^F \\
Y^H
\end{matrix}
\begin{pmatrix}
\epsilon^{Z^F} & \epsilon^{Z^H} & \epsilon^{G^F} & \epsilon^{G^H} \\
-0.1128 & -0.1128 & 0.1075 & 0.1075 \\
-0.1128 & -0.1128 & 0.1075 & 0.1075 \\
0.0523 & -0.0049 & 0.0046 & 0.0046 \\
-0.0049 & 0.0523 & 0.0046 & 0.0046 \\
0.3629 & 0.1683 & -0.1605 & -0.1605 \\
0.1683 & 0.3629 & -0.1605 & -0.1605 \\
0.2163 & -0.0612 & 0.0583 & 0.0583 \\
-0.0612 & 0.2163 & 0.0583 & 0.0583 \\
2.4059 & -1.1267 & -0.1623 & -0.1623 \\
-1.1267 & 2.4059 & -0.1623 & -0.1623 \\
-0.7724 & 0.7724 & -0.5 & 0.5 \\
0.0557 & 8.8003 & -3.3061 & -3.3061 \\
8.8003 & 0.0557 & -3.3061 & -3.3061 \\
2.0446 & 0.2812 & -0.2681 & -0.2681 \\
0.2812 & 2.0446 & -0.2681 & -0.2681 \\
1.9964 & -0.186 & 0.1773 & 0.1773 \\
-0.186 & 1.9964 & 0.1773 & 0.1773
\end{pmatrix}$$

## 11 Statistics of the model

### 11.1 Moments

	Steady-state value	Std. dev.	Variance	Loglinear
$r^H$	0.0351	0.0051	0	N
$C^H$	0.9578	0.034	0.0012	N
$G^{d^H}$	0	0.0922	0.0085	N
$H^H$	0.2645	0.0249	0.0006	N
$I^H$	0.3816	0.2411	0.0581	N
$K^H$	15.2627	0.8242	0.6794	N
$TR^H$	0	0.1586	0.0252	N
$U^H$	-125.6048	0.7839	0.6144	N
$W^H$	3.0384	0.1864	0.0348	N
$Y^H$	1.3393	0.2022	0.0409	N
$Z^H$	1	0.0922	0.0085	N

## 11.2 Correlation matrix

	$r^H$	$C^H$	$G^{dH}$	$H^H$	$I^H$	$K^H$	$TR^H$	$U^H$	$W^H$	$Y^H$	$Z^H$
$\lambda^{cF}$	-0.226	-0.8587	0.315	-0.0583	-0.2102	-0.1567	0	-0.6538	-0.5296	-0.2516	-0.3535
$\lambda^{cH}$	-0.226	-0.8587	0.315	-0.0583	-0.2102	-0.1567	0	-0.6538	-0.5296	-0.2516	-0.3535
$r^F$	-0.0642	0.1313	0.0458	-0.109	-0.4976	-0.1459	-0.6228	0.7667	0.0158	-0.0616	-0.034
$r^H$	1	0.6587	0.5543	0.9181	0.8885	0.1933	0.6228	-0.2736	0.8886	0.9342	0.9831
$C^F$	0.1313	0.6746	-0.2132	-0.072	-0.0901	-0.1031	-0.2407	0.8996	0.351	0.0977	0.2227
$C^H$	0.6587	1	0.06	0.5617	0.5915	0.393	0.2407	0.3136	0.8895	0.7121	0.769
$G^{dF}$	0.0458	-0.2132	0	0.0932	-0.27	-0.1198	-0.493	0.1309	-0.072	0.0289	0
$G^{dH}$	0.5543	0.06	1	0.6253	0.3906	0.1507	0.493	-0.3895	0.3801	0.5447	0.5
$H^F$	-0.109	-0.072	0.0932	-0.2342	-0.5149	-0.4537	-0.4687	0.6968	-0.1711	-0.2157	-0.1368
$H^H$	0.9181	0.5617	0.6253	1	0.8128	0.5124	0.4687	-0.4445	0.8777	0.9809	0.9273
$I^F$	-0.4976	-0.0901	-0.27	-0.5149	-0.8058	-0.1844	-0.8168	0.848	-0.3366	-0.4582	-0.447
$I^H$	0.8885	0.5915	0.3906	0.8128	1	0.2307	0.8168	-0.5013	0.7916	0.829	0.8743
$K^F$	-0.1459	-0.1031	-0.1198	-0.4537	-0.1844	-0.7884	0.1498	0.4338	-0.3103	-0.4093	-0.2156
$K^H$	0.1933	0.393	0.1507	0.5124	0.2307	1	-0.1498	-0.2587	0.5107	0.5274	0.3254
$TR^H$	0.6228	0.2407	0.493	0.4687	0.8168	-0.1498	1	-0.534	0.3983	0.4544	0.5503
$U^F$	0.7667	0.8996	0.1309	0.6968	0.848	0.4338	0.534	-0.0945	0.906	0.8031	0.8435
$U^H$	-0.2736	0.3136	-0.3895	-0.4445	-0.5013	-0.2587	-0.534	1	-0.0639	-0.3034	-0.1974
$W^F$	0.0158	0.351	-0.072	-0.1711	-0.3366	-0.3103	-0.3983	0.906	0.1089	-0.0625	0.0534
$W^H$	0.8886	0.8895	0.3801	0.8777	0.7916	0.5107	0.3983	-0.0639	1	0.9542	0.9576
$Y^F$	-0.0616	0.0977	0.0289	-0.2157	-0.4582	-0.4093	-0.4544	0.8031	-0.0625	-0.1601	-0.0637
$Y^H$	0.9342	0.7121	0.5447	0.9809	0.829	0.5274	0.4544	-0.3034	0.9542	1	0.9679
$Z^F$	-0.034	0.2227	0	-0.1368	-0.447	-0.2156	-0.5503	0.8435	0.0534	-0.0637	0
$Z^H$	0.9831	0.769	0.5	0.9273	0.8743	0.3254	0.5503	-0.1974	0.9576	0.9679	1

## 11.3 Autocorrelations

	$t-1$	$t-2$	$t-3$	$t-4$	$t-5$
$r^H$	0.7036	0.4561	0.2537	0.0926	-0.0318
$C^H$	0.7497	0.5288	0.3382	0.1774	0.0454
$G^{dH}$	0.7133	0.4711	0.2711	0.1098	-0.0163
$H^H$	0.7476	0.5249	0.3327	0.171	0.0384
$I^H$	0.698	0.4473	0.2437	0.0826	-0.0407
$K^H$	0.9564	0.8523	0.7094	0.5455	0.3748
$TR^H$	0.7199	0.4816	0.2831	0.1217	-0.0057
$U^H$	0.7308	0.4987	0.303	0.1419	0.0127
$W^H$	0.748	0.5257	0.334	0.1726	0.0403
$Y^H$	0.7475	0.5248	0.3327	0.171	0.0385
$Z^H$	0.7133	0.4711	0.2711	0.1098	-0.0163

## 11.4 Variance decomposition

	$\epsilon^{ZF}$	$\epsilon^{ZH}$	$\epsilon^{GF}$	$\epsilon^{GH}$
$r^H$	0.0022	0.9869	0.0055	0.0055
$C^H$	0.0587	0.6565	0.1424	0.1424
$G^{dH}$	0	0.25	0	0.75
$H^H$	0.0506	0.8796	0.0349	0.0349
$I^H$	0.2139	0.7803	0.0029	0.0029
$K^H$	0.2084	0.7853	0.0031	0.0031
$TR^H$	0.4367	0.4367	0.0633	0.0633
$U^H$	0.7325	0.0408	0.1133	0.1133
$W^H$	0.0054	0.9676	0.0135	0.0135
$Y^H$	0.0212	0.9689	0.005	0.005
$Z^H$	0	1	0	0

## 12 Statistics of the model

### 12.1 Moments relative to moments of the reference variable

	Steady-state value relative to $Y^H$	Std. dev. relative to $Y^H$	Variance relative to $Y^H$	Loglinear
$\lambda^{c^F}$	0.2937	0.0745	0.0055	N
$\lambda^{c^H}$	0.2937	0.0745	0.0055	N
$r^F$	0.0262	0.0251	0.0006	N
$r^H$	0.0262	0.0251	0.0006	N
$C^F$	0.7151	0.1683	0.0283	N
$C^H$	0.7151	0.1683	0.0283	N
$G^{d^F}$	0	0.4558	0.2077	N
$G^{d^H}$	0	0.4558	0.2077	N
$H^F$	0.1975	0.1233	0.0152	N
$H^H$	0.1975	0.1233	0.0152	N
$I^F$	0.2849	1.1922	1.4214	N
$I^H$	0.2849	1.1922	1.4214	N
$K^F$	11.3957	4.0759	16.613	N
$K^H$	11.3957	4.0759	16.613	N
$TR^H$	0	0.7845	0.6155	N
$U^F$	-93.7814	3.8762	15.0251	N
$U^H$	-93.7814	3.8762	15.0251	N
$W^F$	2.2686	0.9219	0.8499	N
$W^H$	2.2686	0.9219	0.8499	N
$Y^F$	1	1	1	N
$Y^H$	1	1	1	N
$Z^F$	0.7466	0.4558	0.2077	N
$Z^H$	0.7466	0.4558	0.2077	N

### 12.2 Correlations with the reference variable

	$Y_{t-5}^H$	$Y_{t-4}^H$	$Y_{t-3}^H$	$Y_{t-2}^H$	$Y_{t-1}^H$	$Y_t^H$	$Y_{t+1}^H$	$Y_{t+2}^H$	$Y_{t+3}^H$	$Y_{t+4}^H$	$Y_{t+5}^H$
$\lambda^{c^F}$	0.0871	0.052	0.0027	-0.0629	-0.147	-0.2516	-0.2295	-0.2021	-0.1717	-0.1403	-0.1092
$\lambda^{c^H}$	0.0871	0.052	0.0027	-0.0629	-0.147	-0.2516	-0.2295	-0.2021	-0.1717	-0.1403	-0.1092
$r^F$	-0.0996	-0.107	-0.1091	-0.1039	-0.0889	-0.0616	0.001	0.0457	0.0755	0.0931	0.1011
$r^H$	0.1644	0.2797	0.415	0.5699	0.7436	0.9342	0.583	0.301	0.0807	-0.0854	-0.2047
$C^F$	-0.0881	-0.0765	-0.0547	-0.0202	0.0296	0.0977	0.0894	0.0807	0.0719	0.063	0.0543
$C^H$	-0.0428	0.0529	0.1742	0.3236	0.5025	0.7121	0.5623	0.4245	0.3008	0.1923	0.0996
$G^{d^F}$	-0.0492	-0.0463	-0.0384	-0.0243	-0.0024	0.0289	0.0335	0.0357	0.0359	0.0346	0.0321
$G^{d^H}$	0.0486	0.1179	0.2018	0.3009	0.4154	0.5447	0.3727	0.2295	0.1132	0.0212	-0.0489
$H^F$	-0.0311	-0.065	-0.1021	-0.1409	-0.1796	-0.2157	-0.1962	-0.1689	-0.1372	-0.1037	-0.0706
$H^H$	0.0572	0.1869	0.3437	0.5287	0.7415	0.9809	0.7249	0.5007	0.3086	0.1482	0.0177
$I^F$	-0.1696	-0.2254	-0.2844	-0.3447	-0.4037	-0.4582	-0.2427	-0.0758	0.0488	0.1375	0.196
$I^H$	0.1811	0.2834	0.4007	0.532	0.6757	0.829	0.5004	0.239	0.0372	-0.1128	-0.2185
$K^F$	0.0822	0.0142	-0.0694	-0.1685	-0.2824	-0.4093	-0.4701	-0.4805	-0.4542	-0.4026	-0.3353
$K^H$	-0.2716	-0.1819	-0.0602	0.097	0.2922	0.5274	0.6606	0.714	0.707	0.6563	0.576
$TR^H$	0.2452	0.2926	0.3394	0.3838	0.4232	0.4544	0.1448	-0.0813	-0.2373	-0.3358	-0.3881
$U^F$	0.0493	0.1549	0.2828	0.4337	0.6074	0.8031	0.583	0.3934	0.2336	0.1021	-0.003
$U^H$	-0.1146	-0.1545	-0.1956	-0.2359	-0.2729	-0.3034	-0.189	-0.0953	-0.0206	0.0369	0.0793
$W^F$	-0.0682	-0.0802	-0.0881	-0.0896	-0.0821	-0.0625	-0.0566	-0.0465	-0.0341	-0.0208	-0.0075
$W^H$	0.0068	0.1338	0.2908	0.4794	0.7006	0.9542	0.7261	0.5224	0.3447	0.1932	0.0675
$Y^F$	-0.0471	-0.0732	-0.0995	-0.1244	-0.1455	-0.1601	-0.1455	-0.1244	-0.0995	-0.0732	-0.0471
$Y^H$	0.0385	0.171	0.3327	0.5248	0.7475	1	0.7475	0.5248	0.3327	0.171	0.0385
$Z^F$	-0.0898	-0.0993	-0.1037	-0.101	-0.0886	-0.0637	-0.022	0.0101	0.0338	0.0502	0.0605
$Z^H$	0.106	0.2292	0.3768	0.5495	0.747	0.9679	0.6563	0.3977	0.1884	0.0235	-0.1016

## 13 Impulse response functions

### 13.1 Shock $\epsilon^{Z^F}$

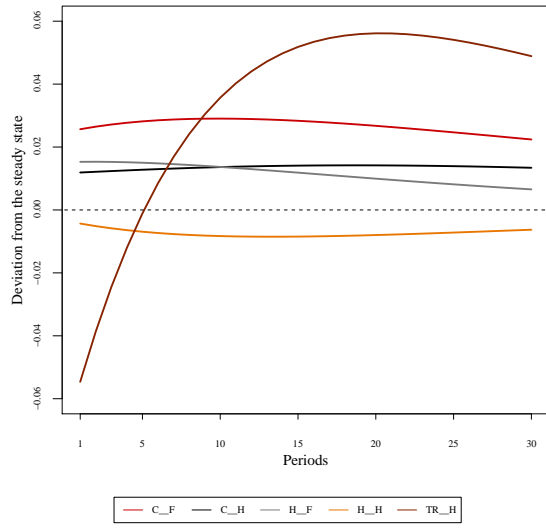


Figure 1: Impulse response function for  $\epsilon^{Z^F}$  shock

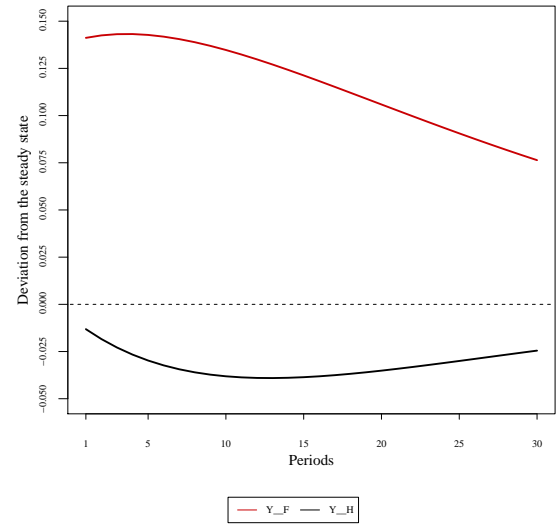


Figure 2: Impulse response function for  $\epsilon^{Z^F}$  shock

### 13.2 Shock $\epsilon^{Z^H}$

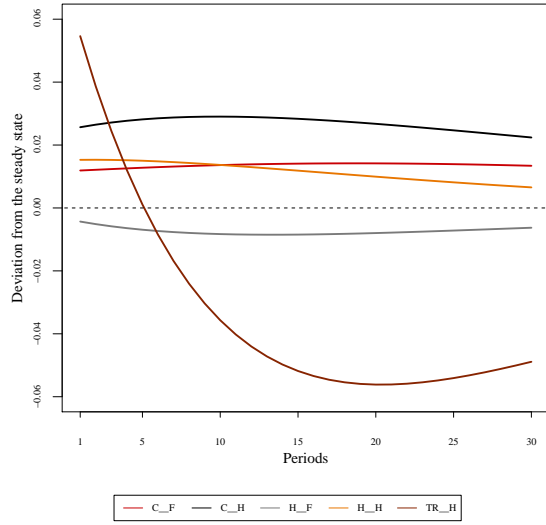


Figure 3: Impulse response function for  $\epsilon^{Z^H}$  shock

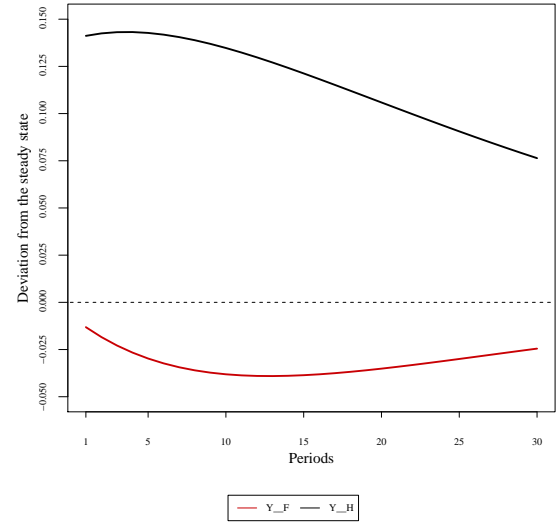


Figure 4: Impulse response function for  $\epsilon^{Z^H}$  shock