1 Modelo Fiscal: Análisis Dinámico

1.1 Variables de Estado

Las siguientes variables aparecen con rezago:

- $y(t-1)$
- $r(t-1)$
- $a(t-1)$
- $c^*(t-1)$
- $\xi_\pi(t-1)$
- $\xi_r(t-1)$
- $\xi_g(t-1)$
- $r(t-2)$

Variables forward-looking:

- $y(t+1)$
- $\pi(t+1)$
- $b(t+1)$
- $g(t+1)$

Variables estáticas:

- r^{nat}

1.2 Valores en Estado Estacionario

Variable	Valor
y	0
π	0
b	0
r	0
g	0
r^{nat}	0
a	0
c^*	0
ξ_π	0
ξ_r	0
ξ_g	0

Table 1: Resultados del Estado Estacionario

1.3 Autovalores

Módulo	Real	Imaginario
0.3406	-0.3406	0
0.4288	0.3378	0.264
0.4288	0.3378	-0.264
0.5	0.5	0
0.5	0.5	0
0.5	0.5	0
0.5	0.5	0
0.7	0.7	0
1.01	1.01	0
2.857	1.853	2.175
2.857	1.853	-2.175
∞	$-\infty$	0

Table 2: Autovalores del Sistema

1.4 Matriz de Covarianza de Shocks Exógenos

Variables	ε_a	ε_{c^*}	ε_π	ε_r	ε_g
ε_a	0.062500	0.000000	0.000000	0.000000	0.000000
ε_{c^*}	0.000000	0.490000	0.000000	0.000000	0.000000
ε_π	0.000000	0.000000	0.160000	0.000000	0.000000
ε_r	0.000000	0.000000	0.000000	0.360000	0.000000
ε_g	0.000000	0.000000	0.000000	0.000000	0.250000

Table 3: Matriz de Covarianza de Shocks Exógenos

1.5 Descomposición de Varianza (%)

Variable	ε_a	ε_{c^*}	ε_π	ε_r	ε_g
y	14.11	0.14	38.05	6.50	41.20
π	3.03	0.03	8.84	70.93	17.18
b	21.37	0.21	31.08	23.81	23.53
r^{nat}	99.04	0.96	0.00	0.00	0.00
r	23.16	0.22	58.19	13.08	5.34
g	15.75	0.15	25.59	8.50	50.01

Table 4: Descomposición de Varianza

Table 5: MATRIX OF COVARIANCE OF EXOGENOUS SHOCKS

$Variables$	ε^a	ε^c	ε^π	ε^r	ε^g
ε^a	0.062500	0.000000	0.000000	0.000000	0.000000
ε^c	0.000000	0.490000	0.000000	0.000000	0.000000
ε^π	0.000000	0.000000	0.160000	0.000000	0.000000
ε^r	0.000000	0.000000	0.000000	0.360000	0.000000
ε^g	0.000000	0.000000	0.000000	0.000000	0.250000

Table 6: Parameter Values

Parameter	**Value**	**Description**
θ	0.500	Calvo Probability
σ	1.000	Inverse EIS
α	0.430	Openness Degree
ϕ	1.000	Inverse Labor Supply Elasticity
β	0.990	Discount Factor
ρ_α	0.500	Productivity Shock Autocorrelation
ρ_{c^*}	0.500	Int. Consumption Shock Autocorrelation
ρ_π	0.500	Domestic Price Shock Autocorrelation
ρ_r	0.700	Interest Rate Shock Autocorrelation
ρ_g	0.500	Public Spending Shock Autocorrelation
γ_π	1.250	Monetary Authority Inflation Gap Response
ζ_π	0.250	Fiscal Authority Inflation Gap Response
γ_y	0.250	Monetary Authority Output Gap Response
ζ_y	1.250	Fiscal Authority Output Gap Response
γ_r	0.700	Interest Rate Smoothing
ζ_g	0.250	Government Spending Response
η	0.690	Domestic-Imported Goods Substitution Elasticity
υ	1.000	Cross-Country Goods Substitution Elasticity
τ	0.033	Effective Income Tax Rate
$\frac{\bar{B}}{\bar{Y}}$	0.530	Steady State Debt-GDP Ratio
$\frac{\bar{C}}{\bar{Y}}$	0.700	Steady State Consumption-GDP Ratio
r^*	0.000	Steady State Interest Rate

Table 7: COEFFICIENTS OF AUTOCORRELATION

Order	1	2	3	4	5
$\tilde{y}_t$	0.6764	0.4563	0.2387	0.1202	0.0555
π_t	0.6787	0.5348	0.4037	0.2842	0.1910
$\tilde{b}_t$	0.7372	0.4940	0.2943	0.1668	0.0934
r^n	0.5000	0.2500	0.1250	0.0625	0.0312
r_t	0.8034	0.5113	0.2791	0.1406	0.0699
$\tilde{g}_t$	0.6017	0.3902	0.1949	0.0998	0.0483

Table 8: MATRIX OF CORRELATIONS

$Variables$	$\tilde{y}_t$	π_t	$\tilde{b}_t$	r^n	r_t	$\tilde{g}_t$
$\tilde{y}_t$	1.0000	-0.5465	-0.8641	-0.2094	-0.8171	0.9536
π_t	-0.5465	1.0000	0.7690	0.1000	0.5792	-0.5717
$\tilde{b}_t$	-0.8641	0.7690	1.0000	0.4307	0.9322	-0.7938
r^n	-0.2094	0.1000	0.4307	1.0000	0.4227	-0.2331
r_t	-0.8171	0.5792	0.9322	0.4227	1.0000	-0.6701
$\tilde{g}_t$	0.9536	-0.5717	-0.7938	-0.2331	-0.6701	1.0000

Table 9: THEORETICAL MOMENTS

$VARIABLE$	$MEAN$	$STD.DEV.$	$VARIANCE$
$\tilde{y}_t$	0.0000	1.4131	1.9968
π_t	0.0000	0.2173	0.0472
$\tilde{b}_t$	0.0000	7.0953	50.3437
r^n	0.0000	0.1508	0.0227
r_t	0.0000	0.2959	0.0875
$\tilde{g}_t$	0.0000	1.2826	1.6450

Table 10: VARIANCE DECOMPOSITION (in percent)

	ε^a	ε^c	ε^π	ε^r	ε^g
$\tilde{y}_t$	14.11	0.14	38.05	6.50	41.20
π_t	3.03	0.03	8.84	70.93	17.18
$\tilde{b}_t$	21.37	0.21	31.08	23.81	23.53
r^n	99.04	0.96	0.00	0.00	0.00
r_t	23.16	0.22	58.19	13.08	5.34
$\tilde{g}_t$	15.75	0.15	25.59	8.50	50.01

$$omega = \sigma\, \upsilon + (1 - \alpha)\ (\sigma\, \eta - 1)$$

$$sigma\_alpha = \frac{\sigma}{1 + \alpha\ (omega - 1)}$$

$$lambda = \frac{(1 - \beta\, \theta)\ (1 - \theta)}{\theta}$$

$$kappa\_upsilon = lambda\ (sigma\_alpha + \phi)$$

$$OMICRON\_R\_LAG1 = \frac{1 + \beta + sigma\_alpha\, kappa\_upsilon}{\beta}$$

$$OMICRON\_R\_LAG2 = \frac{(-1)}{\beta}$$

$$OMICRON\_PI = \frac{kappa\_upsilon\, \gamma_{\pi}}{sigma\_alpha\, \gamma_{y}}$$

$$OMICRON\_Y = \frac{\gamma_{y}}{sigma\_alpha\, \gamma_{r}}$$

$$OMICRON\_R\_TAR = \frac{(-\left(sigma\_alpha\, kappa\_upsilon\right))}{\beta}$$

$$D = kappa\_upsilon + sigma\_alpha + \beta\, sigma\_alpha$$

$$PSI\_G\_PLUS = \frac{\beta\, sigma\_alpha}{D}$$

$$PSI\_G\_LAG = \frac{sigma\_alpha}{D}$$

$$PSI\_Y\_PLUS = \frac{\beta\, sigma\_alpha\, \zeta_{y}}{D\, \zeta_{g}}$$

$$PSI\_Y\_0 = \frac{sigma\_alpha\, \zeta_{y}\ (2 + \beta)}{D\, \zeta_{g}}$$

$$PSI\_Y\_LAG = \frac{sigma\_alpha\, \zeta_{y}}{D\, \zeta_{g}}$$

$$PSI\_PI\_PLUS = \frac{\beta\, sigma\_alpha\, \zeta_\pi\, \left(sigma\_alpha - kappa\_upsilon\right)}{D\, \zeta_g}$$

$$PSI\_PI\_0 = \frac{\left(sigma\_alpha - kappa\_upsilon\right)\, sigma\_alpha\, \zeta_\pi}{D\, \zeta_g}$$

$$CONS = \frac{\alpha\, \left(sigma\_alpha\, \frac{\bar{C}}{\bar{Y}} - sigma\_alpha - kappa\_upsilon\, \frac{\bar{C}}{\bar{Y}} + sigma\_alpha\, \tau - \frac{\bar{B}}{\bar{Y}}\, sigma\_alpha^2 + kappa\_up\ldots\right.}{D\, \zeta_g\, \beta\, \frac{\bar{B}}{\bar{Y}}\ldots}$$

$$J = \zeta_y + \zeta_g + \zeta_\pi\, sigma\_alpha^2$$

$$W = \frac{sigma\_alpha\, \zeta_\pi}{J}$$

$$XI\_G\_PLUS = \frac{\zeta_y}{J}$$

$$XI\_R\_BAR = \frac{kappa\_upsilon\, \zeta_y}{\beta\, J}$$

$$XI\_R\_NAT = \frac{\zeta_y}{sigma\_alpha\, J}$$

$$XI\_R\_LAG = \frac{\left(1 + \beta + sigma\_alpha\, kappa\_upsilon\right)\, \zeta_y}{\beta\, sigma\_alpha\, J}$$

$$XI\_R\_LAG\_2 = \frac{\zeta_y}{\beta\, sigma\_alpha\, J}$$

$$XI\_PI\_PLUS = \frac{\zeta_y + \beta\, sigma\_alpha^2\, \left(-\zeta_\pi\right)}{sigma\_alpha\, J}$$

$$XI\_PI\_0 = \frac{kappa\_upsilon\, \gamma_y\, \zeta_y}{J\, \gamma_r\, sigma\_alpha^2}$$

$$XI\_Y\_PLUS = \frac{\zeta_y}{J}$$

$$XI\_Y\_0 = \frac{\gamma_y\, \zeta_y + kappa\_upsilon\, \gamma_r\, \zeta_\pi\, sigma\_alpha^2}{J\, \gamma_r\, sigma\_alpha^2}$$

$$XI\_Y\_LAG = \frac{\gamma_y \, \zeta_y}{J \, \gamma_r \, sigma\_alpha^2}$$

$$\pi_{tt} = \beta \, \pi_{tt+1} + kappa\_upsilon \, \tilde{y}_{tt} - sigma\_alpha \, \tilde{g}_{tt} + \xi_{\pi t} \tag{1}$$

$$\tilde{y}_{tt} = \tilde{y}_{tt+1} - \frac{1}{sigma\_alpha} \, \left(r_{tt} - \pi_{tt+1} - {r^n}_t\right) - \left(\tilde{g}_{tt+1} - \tilde{g}_{tt}\right) \tag{2}$$

$$\tilde{b}_{tt+1} = r_{tt} - {r^n}_t + \frac{1}{\beta} \, \left(\tilde{b}_{tt} - \pi_{tt} + \tilde{g}_{tt} \, \frac{\frac{\bar{C}}{\bar{Y}}}{\frac{\bar{B}}{\bar{Y}}} + \tilde{y}_{tt} \, \frac{1 - \tau - \frac{\bar{C}}{\bar{Y}}}{\frac{\bar{B}}{\bar{Y}}}\right) \tag{3}$$

$$\begin{aligned} r_{tt} = {} & OMICRON\_R\_LAG1 \, r_{tt-1} + OMICRON\_R\_LAG2 \, r_{tt-2} + \pi_{tt} \, OMICRON\_PI \\ & + \tilde{y}_{tt} \, OMICRON\_Y + OMICRON\_Y \, \tilde{y}_{tt-1} + OMICRON\_R\_TAR \, r^* + \xi_{rt} \end{aligned} \tag{4}$$

$$\begin{aligned} \tilde{g}_{tt} = {} & \tilde{g}_{tt+1} \, XI\_G\_PLUS - r^* \, XI\_R\_BAR - {r^n}_t \, XI\_R\_NAT - r_{tt-1} \, XI\_R\_LAG \\ & - r_{tt-2} \, XI\_R\_LAG\_2 - \pi_{tt+1} \, XI\_PI\_PLUS + \pi_{tt} \, XI\_PI\_0 \\ & - \tilde{y}_{tt+1} \, XI\_Y\_PLUS + \tilde{y}_{tt} \, XI\_Y\_0 - \tilde{y}_{tt-1} \, XI\_Y\_LAG + \xi_{\pi t} \, W + \xi_{g_t} \end{aligned} \tag{5}$$

$${r^n}_t = \frac{sigma\_alpha \, (1 + \phi) \, (\rho_\alpha - 1)}{sigma\_alpha + \phi} \, a_{tt} + \frac{(omega - 1) \, \alpha \, \phi}{sigma\_alpha + \phi} \, (\rho_{c^*} - 1) \, c^*_{t\,t} \tag{6}$$

$$a_{tt} = \rho_\alpha \, a_{tt-1} + {\varepsilon^a}_t \tag{7}$$

$$c^*_{t\,t} = \rho_{c^*} \, c^*_{t\,t-1} + {\varepsilon^c}_t \tag{8}$$

$$\xi_{\pi t} = \rho_\pi \, \xi_{\pi t-1} + {\varepsilon^\pi}_t \tag{9}$$

$$\xi_{rt} = \rho_r \, \xi_{rt-1} + {\varepsilon^r}_t \tag{10}$$

$$\xi_{g_t} = \rho_g \, \xi_{g_{t-1}} + {\varepsilon^g}_t \tag{11}$$

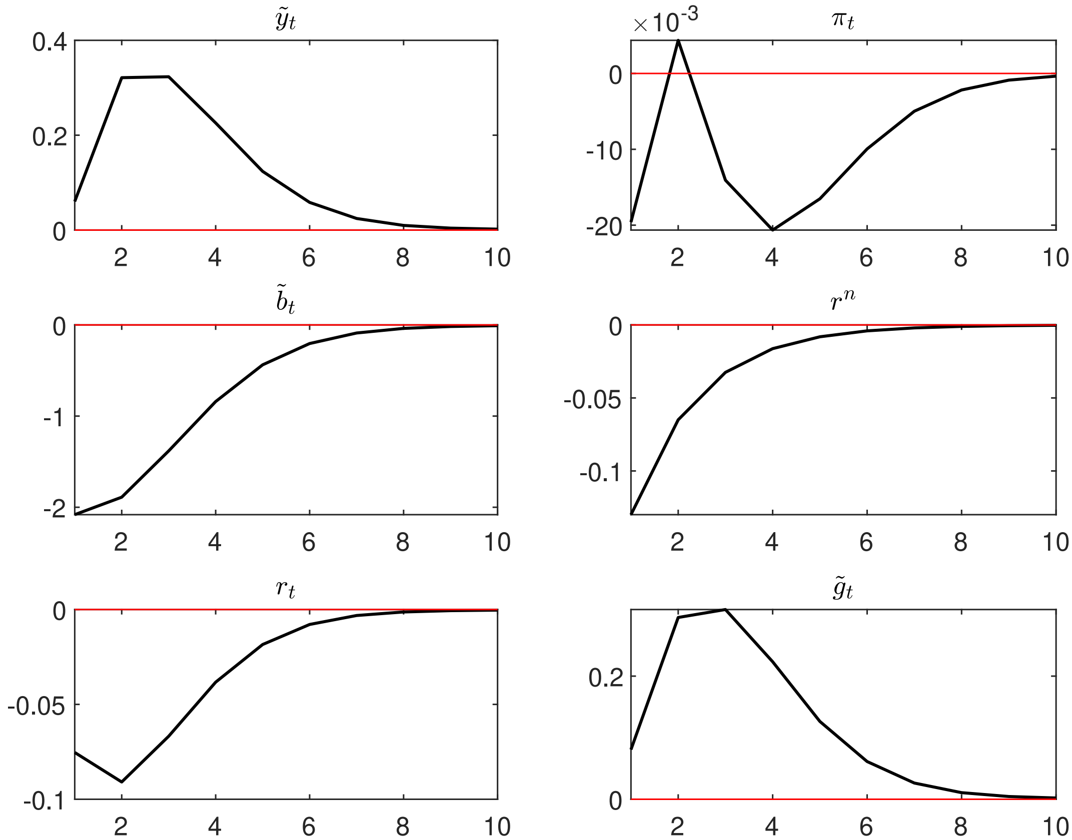

Figure 1: Impulse response functions (orthogonalized shock to ε^a).

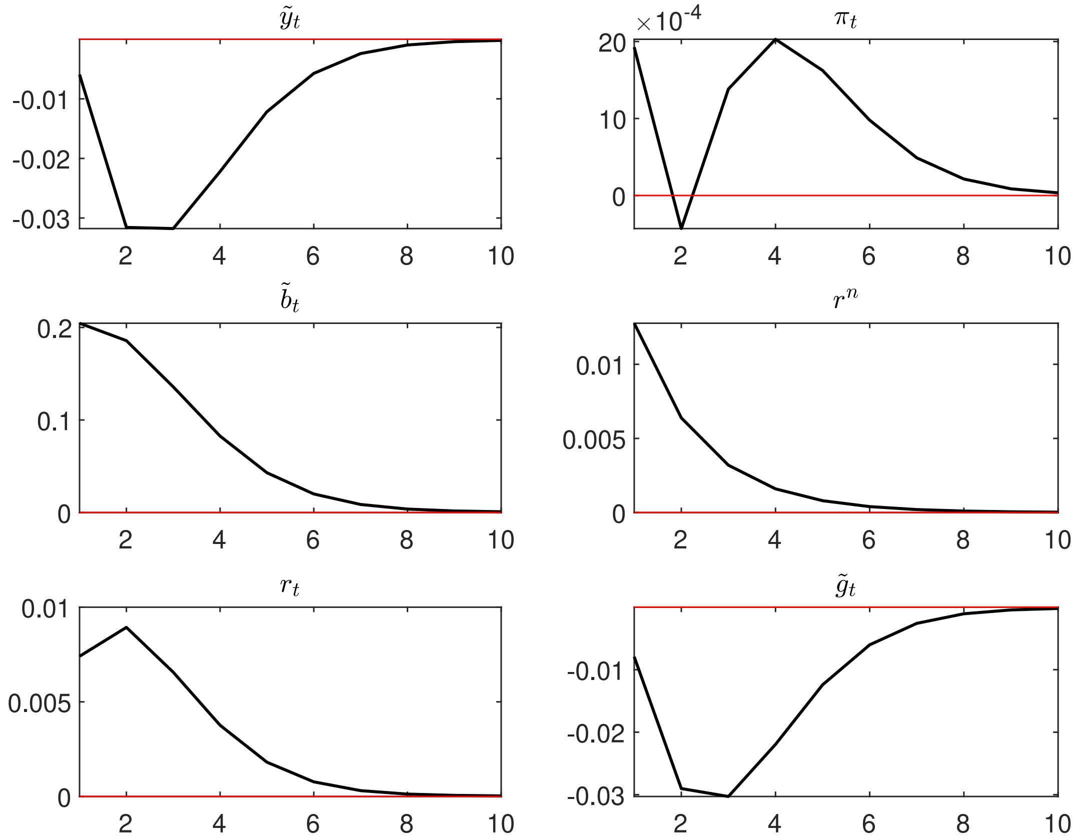

Figure 2: Impulse response functions (orthogonalized shock to ε^c).

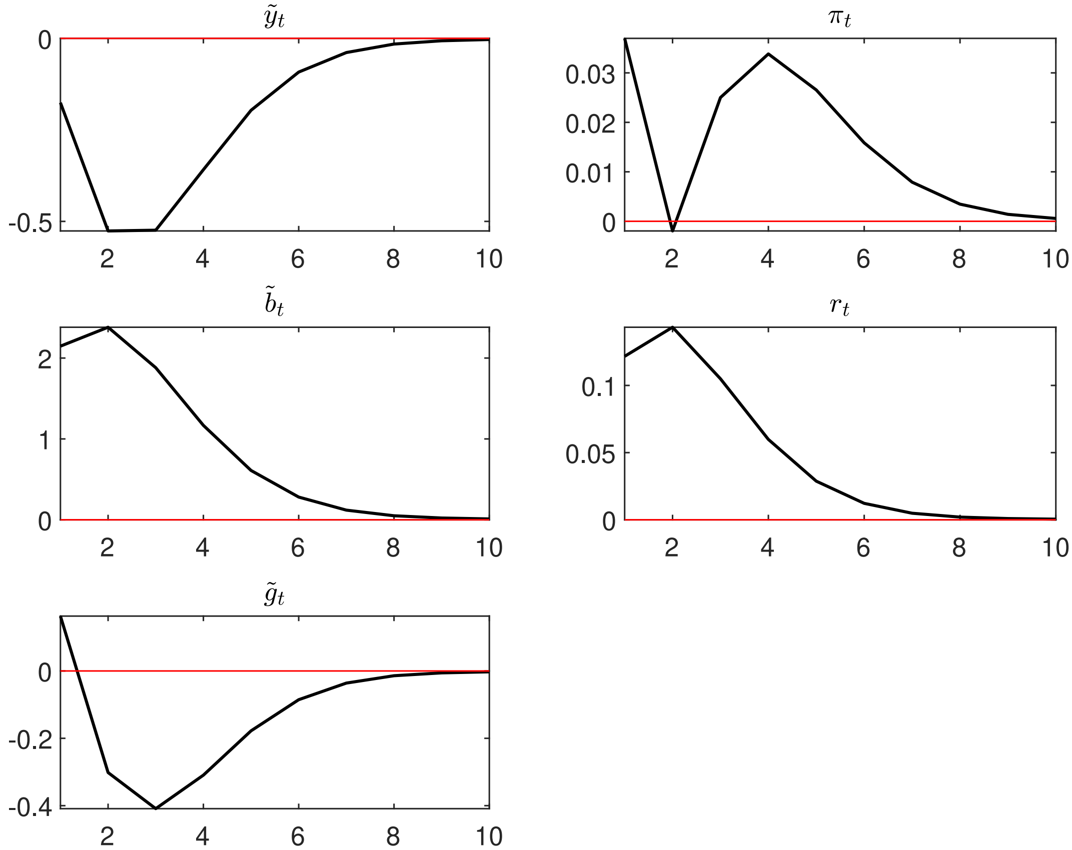

Figure 3: Impulse response functions (orthogonalized shock to ε^{π}).

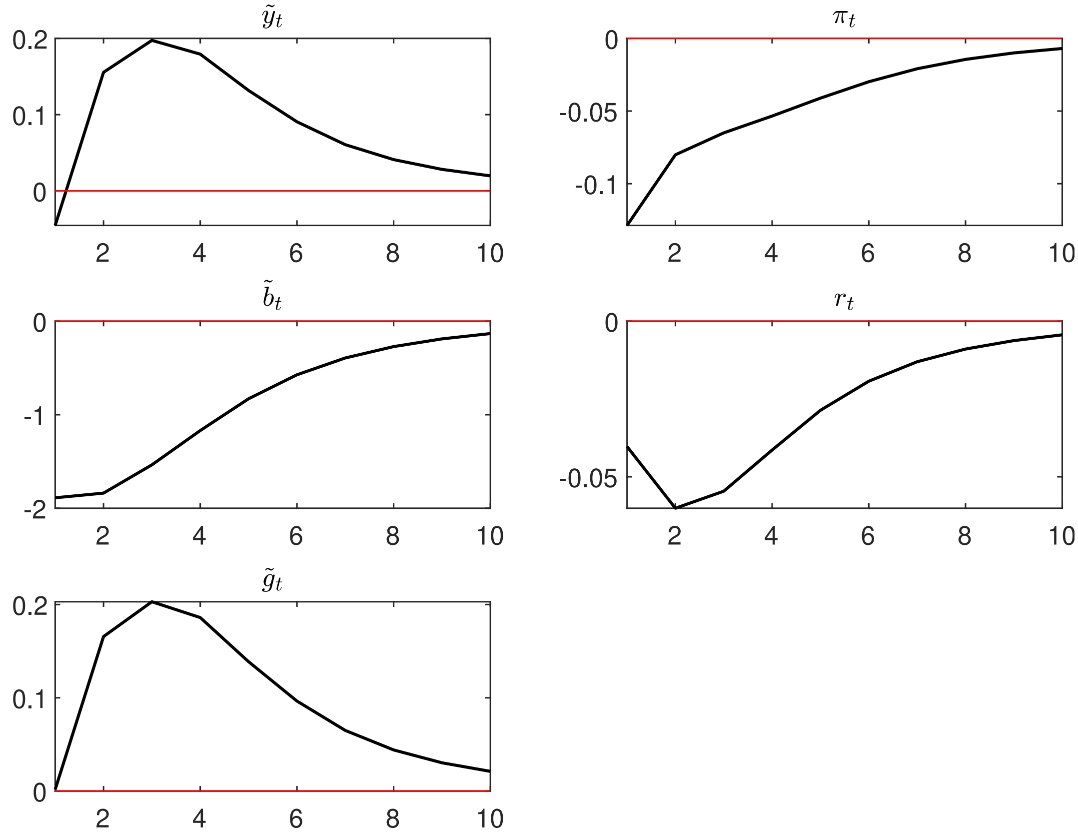

Figure 4: Impulse response functions (orthogonalized shock to ε^r).

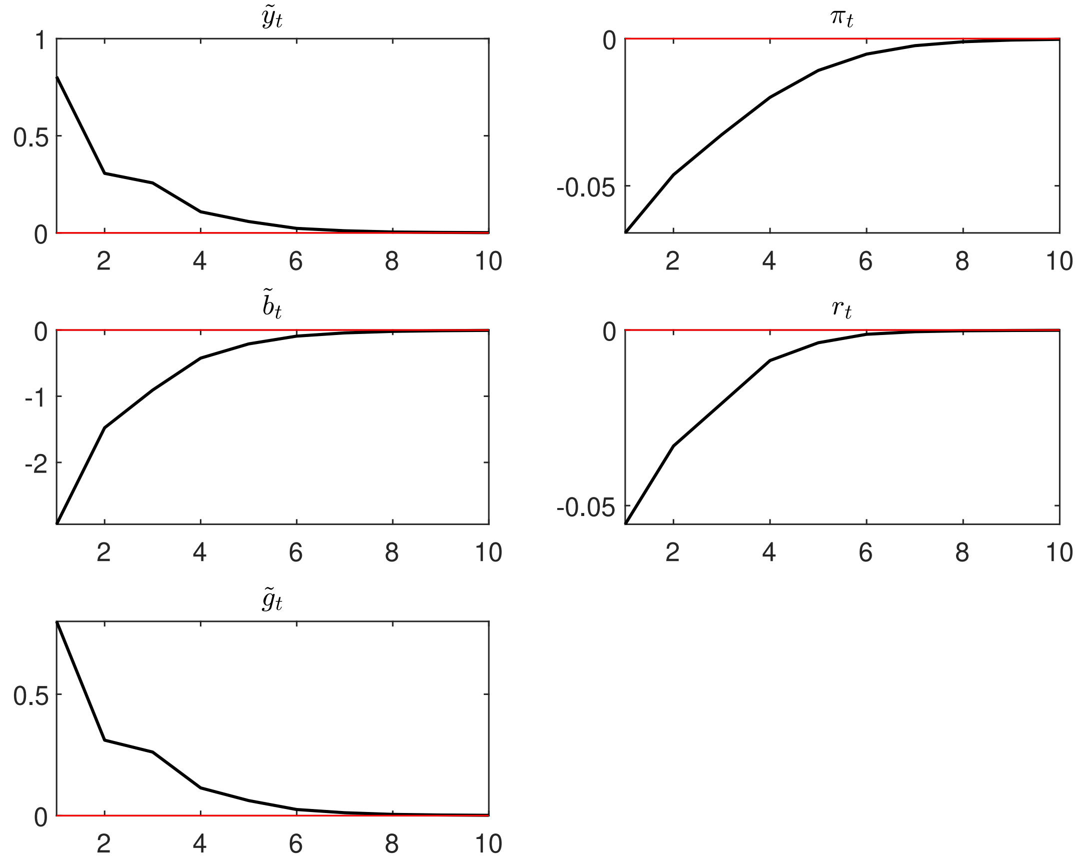

Figure 5: Impulse response functions (orthogonalized shock to ε^g).